ELECTRICAL WEST

FOREMAN FOR THE MORE HIGHLY INDUSTRIALIZED SECTION OF THE U.S.

34th Annual Review and Forecast • February 1946 • 25c

electricity in industry

"The single most important contributing factor to prosperity!"

RICITY SUPPLY 281

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Electricity in Industry—It is probable that the application of electric power to industry in the United States has been the single most important contributing factor in the past quarter century to the country's material prosperity. Increased individual production, greater efficiency, higher wages and higher standards of living have followed this phase of electrical development.

from **ENCYCLOPEDIA BRITANNICA**

Edison Industrial Engineers are available to aid any factory in Edison territory in developing uses of electricity to increase production and lower costs. There is neither cost nor obligation for this service.

SOUTHERN CALIFORNIA Edison

For many months, Edison advertising in the Wall Street Journal has told the story of the achievements of electric power in reducing manufacturing costs and increasing production in industry.

In a brief paragraph, the Encyclopedia Britannica, an impartial recorder of facts, has given its [illegible] praisal of electricity's contribution to industry and its effect on the American way of life. The Encyclopedia's summing up was chosen as the basis of the Edison advertistment reproduced above, which is appearing in the Wall Street Journal and industrial publications.

SOUTHERN CALIFOR[illegible]SON COMPANY LTD.

SOUTHERN CALIFORNIA Edison

ELECTRICAL WEST (with which is consolidated The Journal of Electricity), February, 1946. Vol. 96, No. 2. Published monthly by the McGraw-Hill Company of California, 68 Post Street, San Francisco, 4, Calif. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. Additional entry as second class matter at the post office at Los Angeles. Printed in U. S. A. Subscription rates—U.S., U.S. Possessions and Latin American Republics: $2, 1 year; $3, 2 years; $4, 3 years. Canada: $2.50, 1 year; $4, 2 years; $5, 3 years. Other countries: $3, 1 year; $5, 2 years; $6, 3 years. Single copy, 25c.

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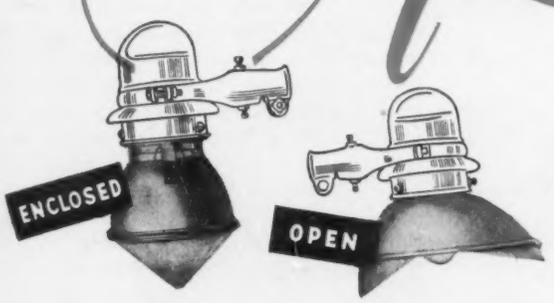
Announces

A Basic Advance in SUBURBAN STREETLIGHTING

Two new reflectors-- using 1000- to 2500-lumen lamps



These two new reflectors (open and enclosed) are the "better sight" successors to the radial-wave reflector for light-traffic and residential streets — the suburban streets.

When equipped with the new G-E 2500-lumen series lamps of 5⅛-inch light-center length and spaced as recommended, these new reflectors make it practical and economical to meet I.E.S. Standards for suburban streets.

For the first time, they bring scientific light control into the field of minimum-cost street-lighting.

Full details on these new reflectors can be obtained by calling your local G-E office. Apparatus Dept., General Electric Company, Schenectady 5, N. Y.

Adaptable to your present hoods and insulators, they furnish greatly improved visibility as unit-for-unit replacements of radial-wave reflectors.

ARE YOU TYING IN WITH THE NEMA PLAN TO GIVE AMERICA BETTER STREET LIGHTING? REMEMBER . . .

Good Street Lighting Builds Good Will!

STREET LIGHTS *for Better Seeing*

GENERAL ELECTRIC

452-28-5010

ELECTRICAL WEST

VOL. 96 FEBRUARY, 1946 NO. 2

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Cover and frontispiece photos by Don Krogh, Pacific Gas and Electric Co.

CHANGE OF ADDRESS

Circulation Manager,
Electrical West,
68 Post St.
San Francisco 4, Calif.

Please change my address

From .....

To .....

Signed .....

People

Everybody

who furnished us with information, figures, statistics, estimates or even opinions for this issue is a co-author and deserves the thanks of the industry in all of its branches for his contribution to the pool of information and knowledge thus made available to all. Certainly the editors of ELECTRICAL WEST wish to express their personal and staff thanks to these helpers, too numerous to list for fear of omitting others who also participated. For an enterprise like this, the 27th annual harvest of vital statistics about this business, is an industry project, a piece of teamwork made possible by those who contribute to it.

Kenneth Hampton

whose series of good sense articles on business management for dealers reappears in the Sales Guide, deserves special mention. These articles originally appeared in the Sales Guide in 1942, at a time, however, when dealers were dropping out of business to take war jobs or join the armed services. They are so pertinent to today's conditions and so especially valuable to those just starting in business, that Ken Hampton has revised them, brought them up-to-date, and they will run throughout this year. Hampton is manager of Valley Electrical Supply Co., a protege of H. H. "Kelly" Courtright, is interested in a business of his own operated independently, has advised dealers for years under the Through-the-Dealer Plan that Courtright initiated. During the war Hampton was drafted by OPA in Fresno, promoted to San Francisco district headquarters, then to assist Chester Bowles with retail pricing in Washington. He returned last year to Valley Electrical Supply.

Preview

Sales Guide News-Letter

Dealers throughout the West will begin receiving a mid-month tip sheet on appliance futures in February, the first one reporting the big Markets and the news picked up while it's hot.

When Betty Crocker talks about PRESSURE COOKING millions of women will listen!

Betty Crocker

Before long, millions of homemakers will be getting from Betty Crocker the latest, most authoritative information about a better, faster meal-making method—pressure cooking. Betty Crocker tested pressure cooking recipes will be the most exciting cooking news in years...and naturally they'll help you sell the new General Mills Pressure*quick* Saucepan.

It's a new kind of pressure cooking device. It has two truly amazing features which eliminate much of the "pot watching" and guesswork that can complicate pressure cooking . . . the Automatic Magic Metal Cover that vents and seals the saucepan at the proper moment without attention and the exclusive Cooking Control that gives homemakers simpler, surer control over the entire pressure cooking operation.

And when women hear the wonderful news about the new General Mills Pressure*quick* Saucepan—there'll be action . . . buying action . . . because American women know and trust Betty Crocker as the world's most helpful home service authority. They'll want the pressure saucepan she sponsors . . . just as they now want—and *buy*—hundreds of millions of packages of other General Mills products recommended by Betty Crocker.

How the Magic Metal Cover works

When the cover is placed on the General Mills Pressure*quick* Saucepan, it still remains unsealed until all the air has been forced out of the cooking chamber. Then the heated steam inside causes a flexing action in the Magic Metal Cover which clamps it tightly against the rim of the vessel and creates a pressure-tight seal—*automatically*.

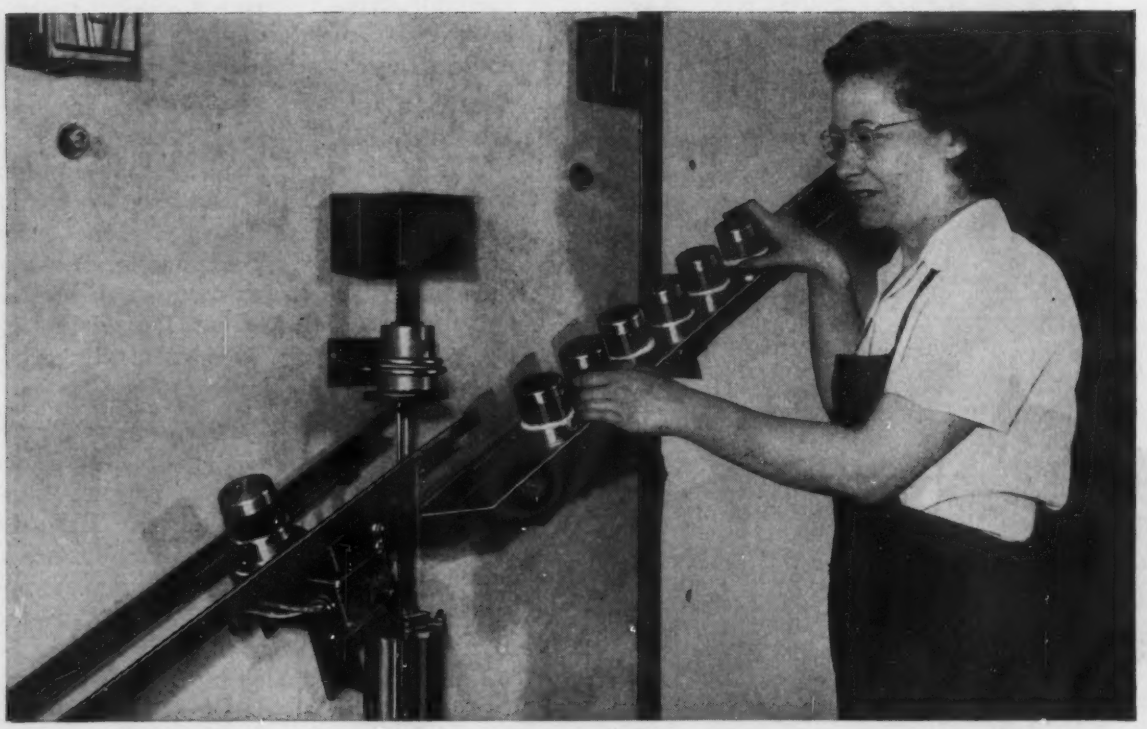
BETTY CROCKER IS A REGISTERED TRADE MARK OF GENERAL MILLS, INC.

GENERAL MILLS, INC., HOME APPLIANCE DEPARTMENT • MINNEAPOLIS 13, MINNESOTA

A-C'S BULLETIN BOARD

* POWER USE NEWS *

Costs Cut One-Third By Induction Heating



IN THE BRAZING application shown above, costs for stock and machine time were cut one-third by using A-C's electronic heater instead of the former non-electrical method. Each assembly required just *nine seconds* brazing time!

Besides making possible faster, cleaner brazing, the induction heating method gives accurate heat zone control for heat treating and surface hardening . . . eliminates metal distortion by its rapid application of heat to a controlled depth.

Induction heating is an example of how *increased use of electrical power helps industry make things better, quicker, cheaper—furthers American good living.* Allis-Chalmers offers both vacuum tube equipment (electronic heaters) for high frequency induction heating, and electronic mercury arc converters for economical heating at the lower frequencies. Write today for newest bulletins.

ALLIS-CHALMERS

ON ELECTRICAL POWER

* POWER SUPPLY NEWS *

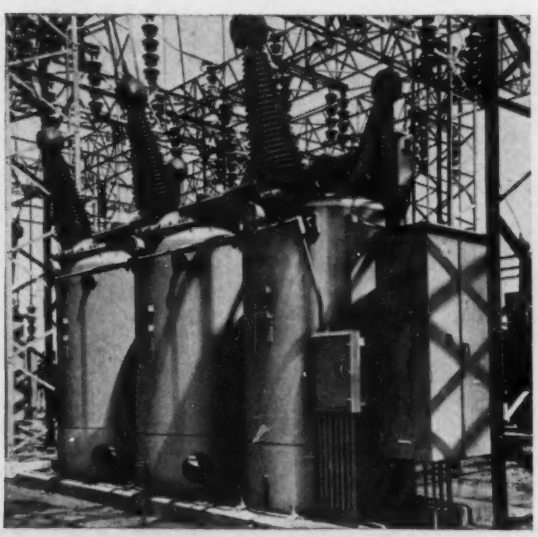
5-Cycle "Ruptor" Gives New System Stability

WHAT IT IS: The 5-cycle "Ruptor" is the interrupting device now employed in Allis-Chalmers outdoor oil circuit breakers rated 115 kv and higher, meeting the new NEMA Standard. It employs the same time-proved principles for limiting arc energy release as does the 8-cycle "Ruptor."

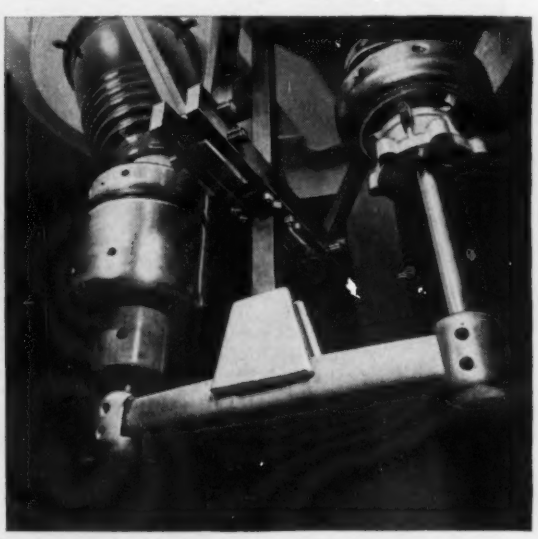
WHAT IT DOES FOR YOU: The new quick-clearing device maintains greater system stability on high voltage lines, and further reduces contact burning and oil carbonization. It assures minimum arc energy release, and low tank pressures.

Exhaustive laboratory tests assure the ability of the 5-cycle "Ruptor", in oil circuit breakers rated up to 3,500,000 kva at 115 kv and higher, to interrupt short circuits from 25 to 100% of rating within 5 cycles after energization of the trip coil.

OTHER DEVELOPMENTS: Ultra-rapid pneumatic operators — now available in Allis-Chalmers outdoor oil circuit breakers rated 15 kv and higher, 500,000 kva and above — reclose breakers within 20 cycles, for improved service continuity on high voltage lines. *For more information on the complete Allis-Chalmers line of outdoor oil circuit breakers, call our nearby district office.*



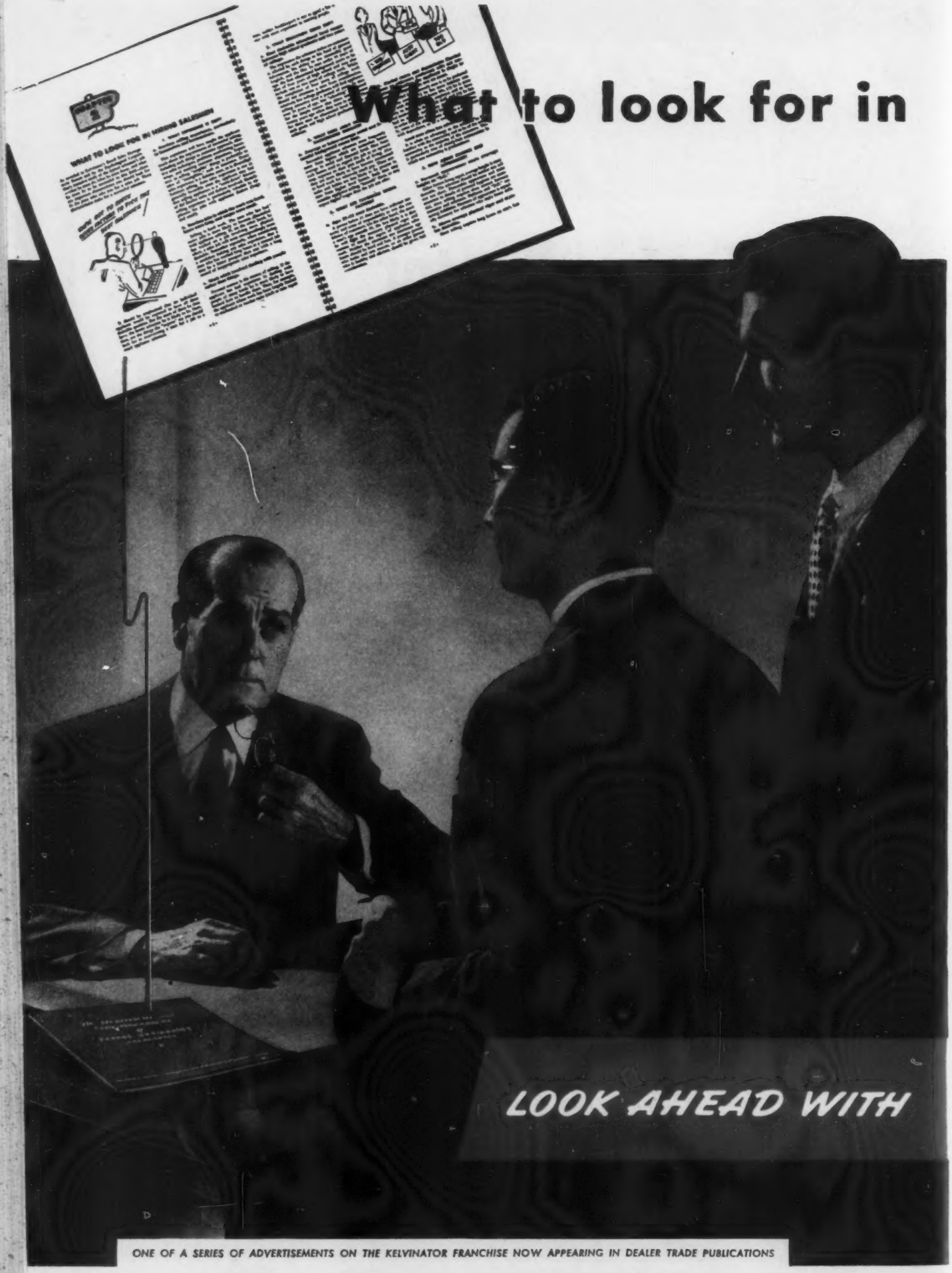
5-CYCLE RUPTORS for greater system stability are built into these Allis-Chalmers type BZO-60-161H outdoor oil circuit breakers installed at a southern substation.



RUPTOR SHROUD at left, in this photograph of a type BZO-60 oil circuit breaker tank interior, limits arc energy release, thus helping to maintain dielectric strength of oil in tank.

A 1954

A-C MILWAUKEE 1, WIS.


What to look for in
LOOK AHEAD WITH
ONE OF A SERIES OF ADVERTISEMENTS ON THE KELVINATOR FRANCHISE NOW APPEARING IN DEALER TRADE PUBLICATIONS

hiring salesmen...

In the selection and hiring of his salesmen, the appliance retailer takes the first and most important step towards building the kind of business he wants to have. For upon their qualities . . . as men and as salesmen . . . depends in a large measure the success of his enterprise.

That's why this element is given such importance in Kelvinator's comprehensive Vocation-in-Sales Training Program . . . that's why one whole section of the guide "The Selection and Compensation of Retail Appliance Salesmen" is devoted to solid, factual, down-to-earth information and suggestions concerning the selection and hiring of the *right* kind of men. No "textbook theory," all of the subject matter is based on the practical experience of retail sales executives from leading department, furniture, appliance stores and utilities, as well as Kelvinator sales executives, and supplemented by the technical research of outstanding vocational authorities.

Under Chapter 2, "*What to look for in hiring salesmen*," the following vital subjects are taken up in detail:

1. WHAT EXPERIENCE IS BEST?
2. WHAT EDUCATION SEEMS BEST?
3. WHAT DOES EARLY HOME BACKGROUND INDICATE?
4. WHAT ARE FAVORABLE SOCIAL FACTORS?
5. HOW ABOUT MANNER AND APPEARANCE?
6. WHAT MENTAL ABILITIES ARE BEST?
7. WHAT PERSONALITY QUALIFICATIONS SHOULD YOU LOOK FOR?

Here is "brass-tack" thinking . . . an important retail-minded contribution to sales management methods, which is based on the facts revealed by Kelvinator's famed Retail Sales Management Forum.

In every one of its other phases too, Kelvinator's great V. I. S. Program is retail-minded . . . because every phase grows out of a distinctively Kelvinator way of doing business that makes the Kelvinator Franchise . . .

The most Valuable Franchise in the Appliance Industry

RETAIL-MINDED

Kelvinator

DIVISION OF NASH-KELVINATOR CORPORATION

Kenosha · Milwaukee · DETROIT · Grand Rapids · Lansing

Tune in N-K MUSICAL S
ROOM Nash - Kelvin
new hit musical show
the Andrews Sisters
Massey and Guest St
every Wednesday evening at 10:30
E.S.T.—Columbia Broadcasting System.

America's most exclusive iron!

Back soon—the famous NEVER-LIFT with exclusive features—proven popularity—national promotion.

Now in production, the famous Proctor Never-Lift will soon be on the way to you. It's the iron with the *most* exclusive features—"Push Button Ironing"—"Even Heat" *plus* these other Proctor Firsts... Fabric Dial, Speed Selector and the all-around Proctor Dreadnaught Heating Unit.

The Never-Lift is outstandingly distinctive on your shelves—easily recognized—a top quality, top profit iron. It's coming soon with a powerful coordinated program of national advertising and promotion.

AVAILABLE NOW!

These fine appliances are being shipped to distributors as fast as we can make them! Order from your distributor today.

PROCTOR CHAMPION SPEED IRON. "Even Heat" over entire ironing surface means faster, easier, better work. Fabric Dial.

PROCTOR SILENT AUTOMATIC TOASTER. Handsomely designed . . . automatically makes toast evenly browned to your taste.

It's new... it's exclusive... it's

PROCTOR

AUTOMATIC ELECTRIC APPLIANCES

PROCTOR ELECTRIC COMPANY, PHILADELPHIA 40, PENNSYLVANIA

PRODUCTS

that are news

Surface Cooking Unit (200)

Proctor Electric Co. has developed a new type automatic electric range surface cooking unit, which it designed especially for high speed. A push on the supercharger energizes the element with four times as much wattage as it would have ordinarily. Within 35 to 40 seconds, the unit reaches its peak temperature. A thermostat, placed in the center and springing above the unit to make contact with the bottom of the vessel, maintains the proper heat for all types of cooking from high to warming. It turns the burner off and on as required to maintain the preselected cooking rate or temperature. This unit will turn itself off should the saucepan boil dry and automatically turns itself down when heat approaches cooking temperature selected. Control dials indicate three zones, warming, boiling and drying. The units is of stone-like construction. The standard three-wire electric range service may be used.

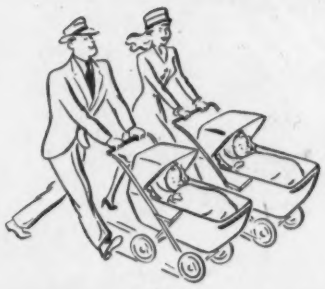
Water Heaters (201)

New Frigidaire electric water heaters feature Radiantube heating units, immersed directly in the water for increased speed. Design of the unit is in the shape of a sickle and, as the heating expands and contracts, any scale is said to fall off and drop to the bottom. Upright heater models will be available in both double and single heating units with capacities of 32, 40, 52, 64 and 80 gal. A 30-gal., single-unit, table-top model also will be produced. Height of the upright models is 57⅞ in. for 32- to 64-gal. sizes, and 71⅝ in. for the 80-gal. heater.

Portable Heater (202)

A portable electric steam heater that can be plugged into a room outlet has been announced by the Wittie Mfg. & Sales Co. In operation, an electric fan draws in the cold air at floor level, while sending a flow of warm air out through a copper tubular-thin core, which, according to the manufacturer, gives uniform heat throughout the room. Degree of warmth is regulated automatically by means of a thermoelectric control. This unit is 22 in. long, 16½ in. high, 8 in. wide, weighs 27 lb.

G-E TWINS REALLY MEAN BUSINESS (FOR YOU!)



New G-E DISHWASHER — New G-E DISPOSALL— With the Greatest Future in the Appliance Market! Slated to Net You a Good Profit!

Here is G-E engineering know-how at its best! Twenty years of research have produced these smooth new "twin" appliances.

G-E Dishwasher now completely automatic! A flick of the wrist takes care of a whole day's dishes—washes and rinses them. They dry in their own heat.

G-E Disposall is the wizard appliance which disposes of food waste (even bones) electrically! Shreds it all up, washes it down the kitchen drain.

No Fuss! No Muss! No Trade-ins! All new merchandise. No complicated turn-ins, fancy deals.

Customers Already "G-E-conditioned!" Your customers have been reading about the G-E Dishwasher and the G-E Disposall for months. In *Life*, *American Home*, *Better Homes & Gardens*, *Parents'*, *Small Homes Guide*.

And they've been hearing about these work-saving twins on the coast-to-coast radio show, "The G-E House Party." G-E Dishwasher-Disposall promotion the past year represents *twelve times its prewar promotion!*

5-way Selling Opportunity! 5 models (and combinations) to sell now: (**1**) The Electric Sink (Dishwasher and Disposall); (**2**) Sink with Dishwasher; (**3**) Free-standing Dishwasher; (**4**) Disposall for installation in present sink; (**5**) Dishwasher for installation in present work surface. *No trade-ins to fuss about!*

Get going! The earlier the better! Let the G-E Twins help push your profits UP!

See your G-E distributor today for full information including color catalog and display material. The General Electric Co., Appliance and Merchandise Dept., Bridgeport, Conn.

• • •

For good listening: *Don't miss Art Linkletter in "The G-E House Party," every afternoon, Monday through Friday, 4 p.m., E.S.T., CBS.*

Recommended National Retail Delivered Prices:

G-E ELECTRIC SINK (with Dishwasher and Disposall)... $279.00

SINK (with Dishwasher only). $199.50

G-E DISPOSALL $79.50

G-E AUTOMATIC DISHWASHER (Cabinet model) $139.50

G-E AUTOMATIC DISHWASHER (chassis only) $124.50

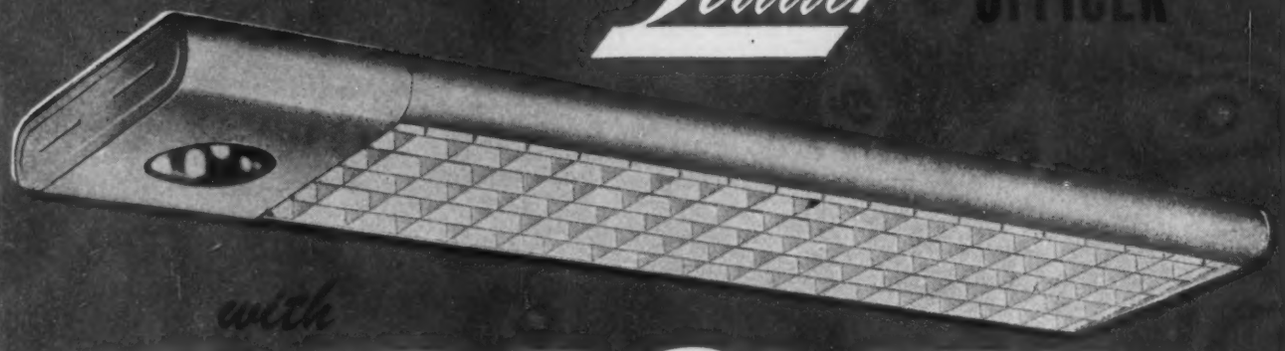
G-E DISHWASHER AND DISPOSALL*

*REG. U. S. PAT. OFF.

The Complete Table-to-Shelf Dish Job Done Automatically

GENERAL ELECTRIC

NOW THE *Leader* OFFICER

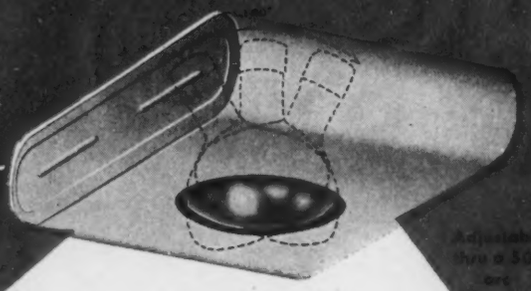


with

"DIRECLITE"

The most Outstanding Commercial Fixture

Plus . . . . MERCHANDISE *"Spot"* LIGHTING



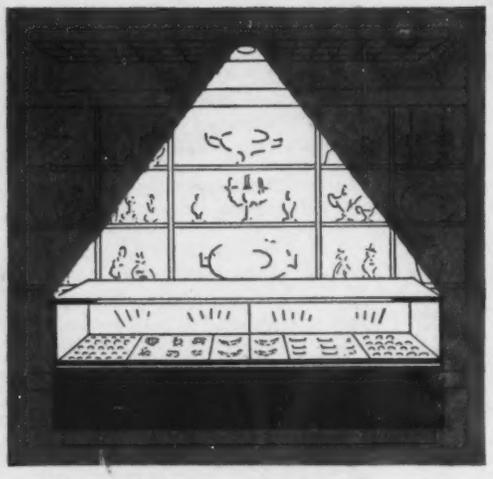
Leader Engineers now present the Direclite for spot lighting of merchandise. Direclite is easily attached at the end of a single unit or the center of a continuous run installation where any Leader Officer is used.

Thousands of installations have already proved the superiority of the Leader Officer Unit. Here is a fixture combining utility and high light output with beauty of design.

Now the Officer Unit is available for additional merchandising uses, thus giving it extra merit to the high position it already enjoys.

Representatives in all principal cities.

Distributed only through the Better Electrical Wholesalers



THERE IS A LEADER REPRESENTATIVE IN YOUR AREA

Leader ELECTRIC MANUFACTURING CORP.

6127 NORTH BROADWAY • CHICAGO 40, ILLINOIS

WEST COAST FACTORY • 2040 LIVINGSTON STREET, OAKLAND 6, CALIF.

"THE Inside Story" OF THE SAMSON AUTOMATIC IRON

1000-WATT STEEL-ROCK HEAT UNIT: Embedded . . . safe from air and moisture, quick-heating, current-conserving, long-lasting.

MAGIC EYE: Lights up when current is on and blacks out when off . . . showing economy in current due to ironing much of time on stored heat.

PRECISION THERMOSTAT: Dependable automatic control of iron temperatures actually right at ironing surface.

DUO-DIAL HEAT CONTROL: Measures the heat to suit a particular fabric when ironed at a particular speed . . . the *selective-speed* feature that makes this the supremely safe iron in anybody's hands.

AIR-COOLED PLASTIC HANDLE: Fashioned for a comfortable grip . . . cool to the hand, easy on the wrist.

BUILT-IN CORD: With Rubber Guard. Approved 10,000-cycle.

LIGHT WEIGHT (4 lbs.) . . . Perfectly balanced for arm and wrist ease.

TAPERED POINT . . . BEVEL EDGE: Easy ironing into pleats and folds, as well as around buttons.

NEVER-CATCH HEEL for unimpeded back-strokes in ironing.

SAFETY-TILT . . . ROCK-TO-REST: An effortless rocking motion stands the iron on its handle, with ALL hot metal off the board . . . and at just the right tilt and firm rest for safety.

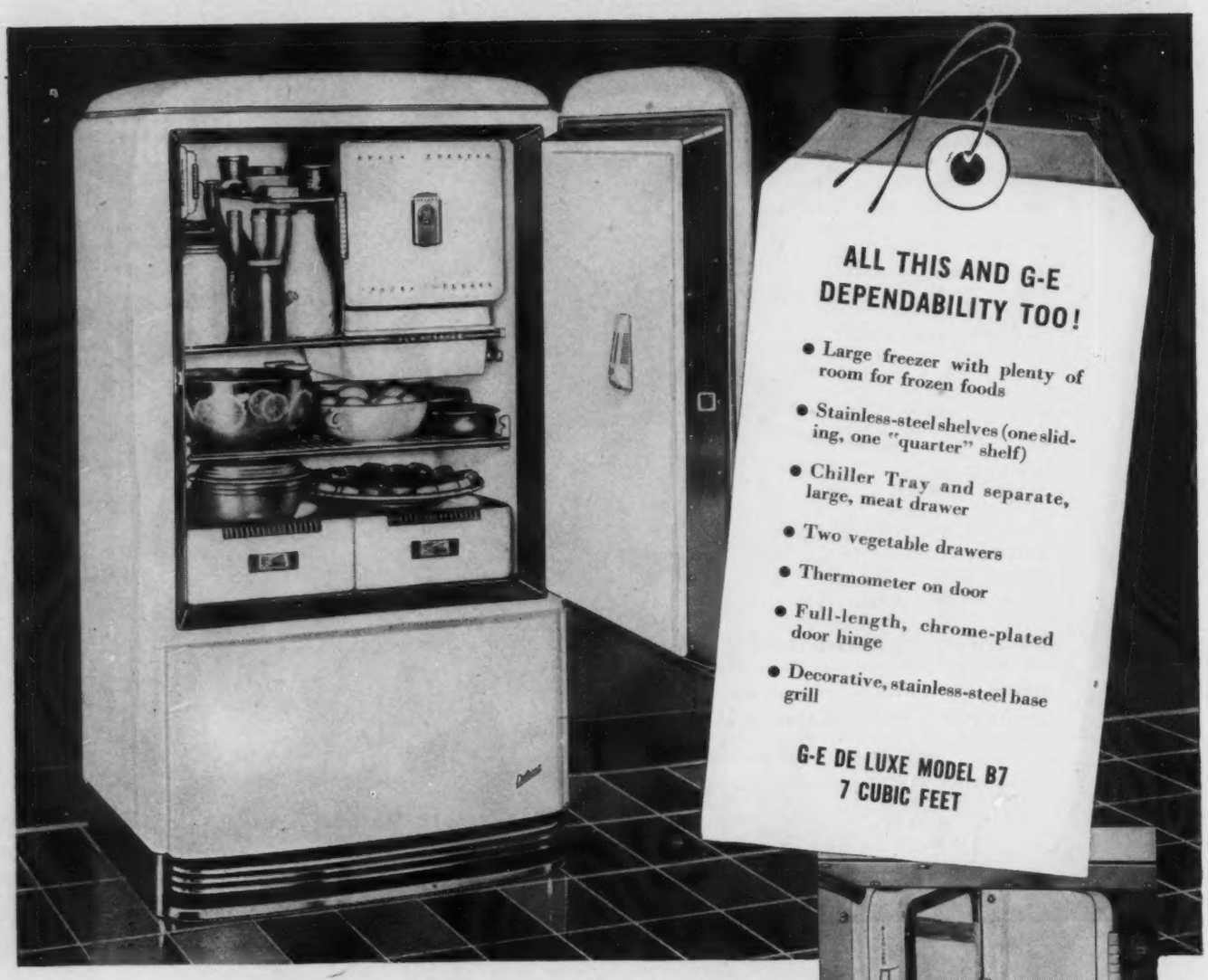
STREAMLINE BEAUTY in gleaming chromium plate and black plastics.

WE HAVE one big reason for presenting this cutaway view of the SAMSON Automatic Iron . . . namely so that you can see for yourself the high quality construction that makes possible the long list of sales-making SAMSON features. And for plus value, every SAMSON iron comes in a colorful, eye-catching package that serves as a self-selling display.

SAMSON UNITED CORPORATION, ROCHESTER 10, N. Y.
Samson United of Canada, Limited, Toronto

If you'd rather make sales than promises...

HERE'S YOUR REFRIGERATOR


ALL THIS AND G-E DEPENDABILITY TOO!
• Large freezer with plenty of room for frozen foods
• Stainless-steel shelves (one sliding, one "quarter" shelf)
• Chiller Tray and separate, large, meat drawer
• Two vegetable drawers
• Thermometer on door
• Full-length, chrome-plated door hinge
• Decorative, stainless-steel base grill
G-E DE LUXE MODEL B7
7 CUBIC FEET

The great refrigerator you're looking at is *not* a "coming-in-the-future" model.

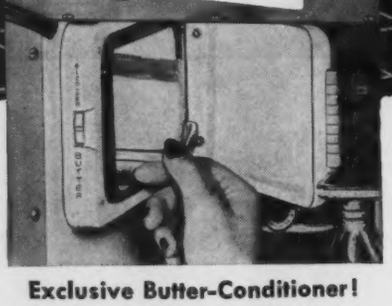
It's a brand-new 1946 model!

And it's one you can *show* your customers . . . make delivery on . . . and (this is important) get good hard cash for, NOW.

You've never in your life sold a better refrigerator than this G-E B7. It's got beauty . . . style . . . and a raft of features women will go for in a big way.

Remember, more women prefer G-E Refrigerators than any other make. And the big reason is *dependability* . . . dependability that comes from the G-E "sealed-in-steel" unit. That famous unit —made more efficient than ever—is your *big* selling point.

For further information, see your Distributor. General Electric Co., Appliance and Merchandise Department, Bridgeport, Conn.



Exclusive Butter-Conditioner!

Special compartment keeps butter at exactly the degree of spreading softness desired. Holds a full pound. What a sales-maker!

G-E Refrigerators

"THE REFRIGERATORS MOST PEOPLE WANT MOST"

GENERAL ELECTRIC

ELECTRICAL WEST Sales Guide

NEWS LETTER FOR THE ELECTRICAL MERCHANT OF THE WEST

February
1 9 4 6
©

Coming back from attending the Chicago markets everyone's enthusiasm for the new appliances they saw was high. It foretold a wonderful selling boom if, as and when. Prospects for making a fine showing of new appliances at the San Francisco market looked bright too, if---

Dead stop!

You said it. Strikes! Except for a trickle of appliances from independent manufacturers who had some stockpile of materials and are not themselves struck, the appliance industry has come to a dead stop. Steel and components made by the big three, General Electric, Westinghouse and General Motors (such as fractional horsepower motors, switches, thermostats, etc.), are needed by all. There is no predicting at this writing, when it will end.

Scale down

One more adjustment dealers and distributors should make. Write down both the volume of appliances that can be expected for the entire year and the purchasing power of people in industrial cities who may eat up that savings balance that was to go for a new appliance or two.

Fair Trade under fire

Fair Trade may be under fire from the Federal Trade Commission if it can build up a case. Dealers on the whole have long urged manufacturers to put their branded appliances under Fair Trade laws, applicable in 46 states. Iately a large number of the major manufacturers have declared themselves under it. FTC just released a 38-page report called "Resale Price Maintenance" and entered a fight in District of Columbia where efforts to have Fair Trade established by Congress gave it an opening. Those who believe in it should be forewarned that it may need to be defended vigorously soon.

Range ceilings

OPA has placed all new gas and electric ranges under dollar and cents ceilings at 1942 levels. Manufacturers are required to ticket each range with its price which includes federal tax and installation charge. A one-year guarantee must be given too.

Water

Electric water systems will get intensive nationwide push again as the farm market for these systems opens up wide for dealers everywhere.

Separate

At Premier's recent meeting of its 17 district managers, attended by A. F. Schlosser, Los Angeles, and R. E. Baird, San Francisco, C. R. Pritchard of General Electric declared that this division of G-E would continue to distribute through independent distributors.

Valances

Like the pin-it-up lamps which it pioneered the Railley Corp. of Cleveland now has a wall or window frame attachable window valance equipped with fluorescent lamps as well as two curtain rods for drapes and curtains. John Maddox says stock is beginning to arrive in the West.

Shorter

Philco has shortened its long name to Philco Products, Inc. This is because it makes more than radio and television now, including refrigerators, freezers, air conditioning, batteries.

Expands

Conlon, maker of washers and ironers, just purchased Moore Corp. of Joliet, Ill., maker of furnaces and ranges. When Conlon acquired the heating pad business of Eagle Electrical Mfg. in 1944 it announced expansion into other appliance lines.

Handy

Handyhot, made by Chicago Electric Mfg. Co., says it will add a portable washer to its line of appliances and fans. It makes the Sunkist Juicits for California orange growers.

New miracles

Miracle appliances, according to its President Friedman, will have some new miracles in its extended line of small appliances. An all metal coffee maker, food mixer with built-in power unit, portable mixer, two automatic irons, a steam iron that irons wet or dry, both electric and non-electric vacuum cleaners, massagers, hot plates, waffle iron, etc. are announced.

Sales training

First showings of the sales training films prepared jointly by EEI and NEWA were given in Salt Lake City by Utah Power & Light, which has already started a program of sales training, employing this material for all dealers and sales people in its various divisions. Vere Halliday is directing it.

Hot Recipes

Hotpoint has put humor into hot water. In a clever booklet called "Recipes for Hot Water" it gives directions for making dirty boys clean, doing dishes quickly, feminine loveliness, etc., presenting all the advantages of hot water from the user's point of view.

No discounts

Employee sales of appliances will no longer be made by Southern California Edison with its cessation of merchandising. The large stock, staff and detail involved, plus the goodwill of dealers outbalanced its appeals.

Sleep warm

Simmons has added an electronic blanket to its sleep line. This seems to be the extent of its electrical appliances unless rocking beds come into being. The blanket, like its predecessor by G-E, has temperature control based on room temperature, operates at low voltage and has a safety cut-out in case of open circuit. With two big companies selling blankets the advertising and hence the market should be fine for dealers.

Fe

LOOK TO UNIVERSAL FOR THE

ONLY COMPLETE LINE

OF HOME CLEANING EQUIPMENT

Today, Universal is the only manufacturer offering dealers a complete line of Home Cleaning and Floor Maintenance Equipment. Included are Universal's famous Tank Type Clean-Air Cleaner with the "Tattle-Tale" Light, Super-Value Brush Type Cleaners, Hand Cleaners, the sensationally new Sani-Tray Carpet Sweeper for occasional cleaning and the Floor Polisher.

This line spearheaded by America's top Tank Cleaner means greater profits through multiple sales. No other manufacturer can offer dealers such a big money-making future in Home Cleaning Equipment—for no other manufacturer offers this complete line. *See your nearest Universal distributor today for full details on Universal's big "Clean-Up" Program for 1946.*

ARMY E NAVY

UNIVERSAL

LANDERS, FRARY & CLARK • NEW BRITAIN, CONN.

Universal Electrical Appliances distributed in Canada exclusively by Northern Electric Company, Ltd.

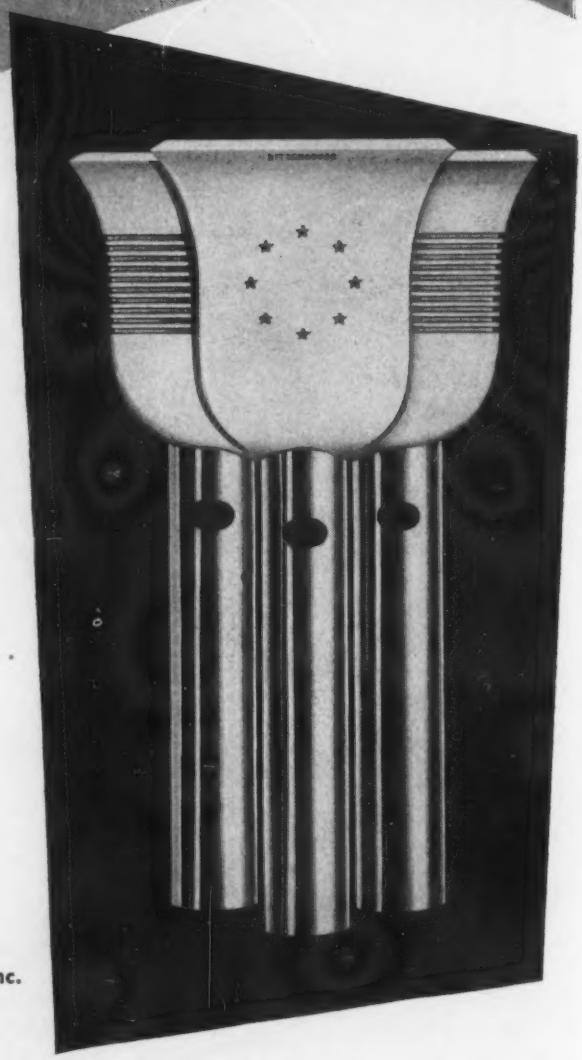
LEADERSHIP THAT BUILDS YOUR DEALERSHIP!

You're on your way to SURE Profits
...when you feature

Rittenhouse

Golden Tone

DOOR CHIMES



With the tremendous sales momentum Rittenhouse Magazine and Newspaper advertising has already created for 1946 Rittenhouse Chime models, wholesalers and dealers *know* they are not gambling on guess-work when they get behind the new, "Big Time" Rittenhouse Chime sales program. It's paying off *now* and coming months will be better still.

Rittenhouse dealers can take our word that the greatest, most complete Rittenhouse merchandising drive ever launched will gain new power—and new speed—in its 1946, *pre-tested* chime-selling job!

Just as Rittenhouse eliminated all objectionable chime "static"—mechanical noises—from 1946 models . . . and thus made possible new triumphs in tone perfection . . . so will continually publicized Rittenhouse Chime beauty, mechanical features and Norman Bel Geddes style accomplishment start a steady flow of consumer-buyers to Rittenhouse dealers—*in all communities.*

This stunning, Ivory Plastic **BEVERLY MODEL** is but one of the ten new Rittenhouse 1946 Chime beauties home owners will open their pocket-books to, the moment they see and hear it.

Write for a copy of the Rittenhouse Broadside illustrating the complete line and outlining the 1946 Rittenhouse advertising and product promotion plans.

The A. E. RITTENHOUSE COMPANY, Inc.
HONEOYE FALLS, NEW YORK

♫ Rittenhouse ♫

AMERICA'S FINEST CHIME SIGNALS

DAY-LINE*

The "ONE-MAN" *Fixture*

This heavy-duty Day-Brite Industrial Fluorescent system saves time and money on every installation —every service operation:

- One man *alone* can quickly hang the Day-Line with chain or patented Day-Brite "Ice-Tong" hangers.
- Rugged, die-formed steel channels designed for simplified unit or continuous mounting—plenty of knockouts.
- Lifetime porcelain enameled steel reflectors fastened with two captive wing nuts can be removed and replaced in one minute for easy installation and servicing—*without tools.*

Day-Brite Lighting, Inc., 5411 Bulwer Avenue, St. Louis 7, Mo. Nationally distributed through leading electrical supply houses.

In Canada: address inquiries to Amalgamated Electric Corporation, Ltd., Toronto 6, Ontario.

* Patent Nos. 2317434, D135375, D133458

944

IT'S EASY TO SEE WHEN IT'S

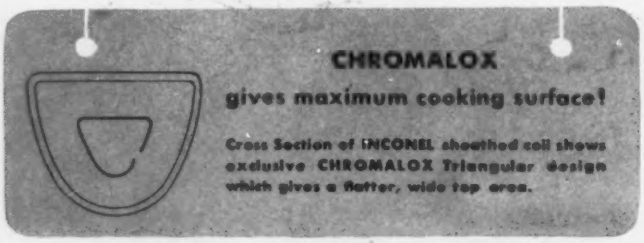
DAY-BRITE *Lighting*

Chromalox Triangular *Electric* Range Units are Easier to Sell

You'll say it's so every time—when you stock CHROMALOX Triangulars. Housewives praise the advanced features . . . and you'll like the faster turnover and profits which are yours with CHROMALOX.

CHROMALOX Triangulars are easier to service and install too. For with only two unit sizes and a supply of low-cost Adaptor Rings you service *all* electric ranges.

Here is your opportunity to capture the range unit replacement market. Write to the address below for folders CF-145 and L-1023 giving replacement data on all electric ranges.


CHROMALOX
gives maximum cooking surface!
Cross Section of INCONEL sheathed coil shows exclusive CHROMALOX Triangular design which gives a flatter, wide top area.

EDWIN L. WIEGAND COMPANY • 7540 THOMAS BLVD. • PITTSBURGH 8, PA.

Montgomery Bros., 420 S. San Pedro St., Los Angeles, Calif.; 2333 N.W. Westover St., Portland 10, Oregon; 1122 Howard St., San Francisco 3, Calif.; 911 Western Ave., Seattle 4, Wash.
The Peterson Co., 1921 Blake St., Denver 2, Colorado

RC-12

on new ranges and for replacements

CHROMALOX means *"Electric Cooking at its Best!"*

Combination Fixture (203)

A fixture which combines the infrared lamp and the ultraviolet sun lamp in one unit has been developed by Westinghouse. Called the Select-o-ray, the device is adaptable as a floor or table model and is equipped with a two-way three-position switch. The dual unit delivers ultraviolet rays from one end and infrared from the other, switch position and direction of name-plate arrows indicating which is being emitted. Life of the heat lamp is in excess of 5,000 burning hours and the sun lamp will give more than 400 applications, according to the manufacturer. This unit is finished in ivory enamel, weighs 12 lb. It can be extended to a height of 63 in. or lowered to 40 in.; lamp unit may be moved up or down and held in the position wanted.

Radio Line (204)

The Stewart-Warner radio line includes 14 models. Announced improvements include the "radair antenna" a built-in loop designed to pick out faint signals but to repel static interference; a "signal sentry" to eliminate fading and hum. A feature of the push-button sets is the "ferro-lock" circuit, designed to eliminate instability. The automatic record changer on combination models is operated with one control. The line has plastic and wood table models, several furniture models, including commode, drop leaf table and pedestal commode types, battery models.

F Home Lighting (205)

John C. Virden Co. has entered the fluorescent home-lighting field with two fixtures. These fixtures have luminous side panels, curved metal end plates with insets of molded translucent plastic. Finish is white and chrome or ivory and gold. The louvers are hinged and starters inset. Available are a two-lamp 20-watt, a two-lamp 40-watt, and two four-lamp 20-watt units.

Temperature Control (206)

Drayer & Hanson, Inc., have announced a new model Airtopia, device for temperature and humidity control and for air purification. The smallest unit fits into a space 3½ x 5 x 7 ft. and is described by the manufacturer as suitable for a seven-room house or small office or store. Larger units are available for homes, office buildings, laboratories, stores, etc.

Farm Freezers (207)

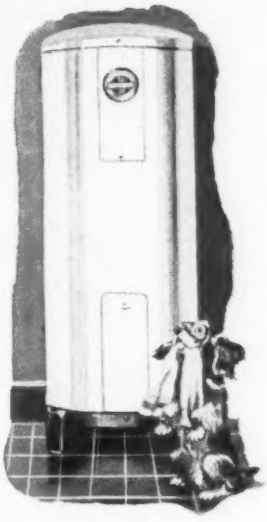
Carrier Corp. has in production two upright farm freezers, a 30- and 15-cu. ft. model. The larger has storage space for 1,000 to 2,000 lb. of frozen food and the smaller, 500 to 600 lb., according to the announcement. Freezing capacity of each unit is said to be from 50 to 75 lb. per day.

Door Chimes (208)

Mell-O-Chime is offering two lines of electric door chimes, the Populaire and Symphonique. A variety of styles is available in single color and duo color finishes. Long and short tube models and small tone-bar models are available.

Electric Heaters (209)

General Electric has two portable electric heater models in production, the Arizona, radiant convection type, and the Sunbowl, featuring a 14-in. copper reflector.



Can you find the Frigidaire Salesmen in these pictures?

You needn't look very far: every user of a Frigidaire appliance is a Frigidaire salesman! Every homemaker whose Frigidaire refrigerator or electric range delivered faithful service day after day during the past years when failure might have been a disaster. Every householder thrilled by all the important features of the Frigidaire refrigerators, home freezers, electric ranges, and water heaters now being delivered in all parts of the country. All these users are "selling" their friends, acquaintances, and relatives on the merits of Frigidaire appliances. Such word-of-mouth advertising is one of the greatest assets of the dealer who holds the Frigidaire franchise...one of the reasons why this is *the most valuable franchise in the industry.*

P. S. If you can't find a Frigidaire "salesman" beside the Frigidaire Water Heater illustrated above, it's because everything about it is so automatic that nobody has to pay attention to it, except to be grateful for all the hot water it produces on very little current.

You're twice as sure with two great names . . .

Frigidaire *made only by* **General Motors**

REFRIGERATORS • RANGES • WATER HEATERS • HOME FREEZERS • KITCHEN CABINETS • ICE CREAM CABINETS
COMMERCIAL REFRIGERATION • AIR CONDITIONERS • BEVERAGE, MILK, AND WATER COOLERS

"Don't look now···

···but isn't that a Railley Lamp?"

● Believe it or not, it might very well *be* a Railley Lamp, for Railley is back in lamp production.

Perhaps "production" is too strong a word for what we've been able to do so far. But the volume is growing every day and it won't be *too* long before there are plenty of Railley lamps for everyone.

We've made a most satisfactory start, but it is, really, *only* a start. Materials are still uncertain . . . bottlenecks keep turning up in the most unexpected places. Nevertheless, the path is slowly growing smoother. Though we can't yet put a date on it, the day is definitely in sight when Railley Lamps will again grace your selling floor in quantity. And they promise to be the sellingest line of lamps we have ever offered.

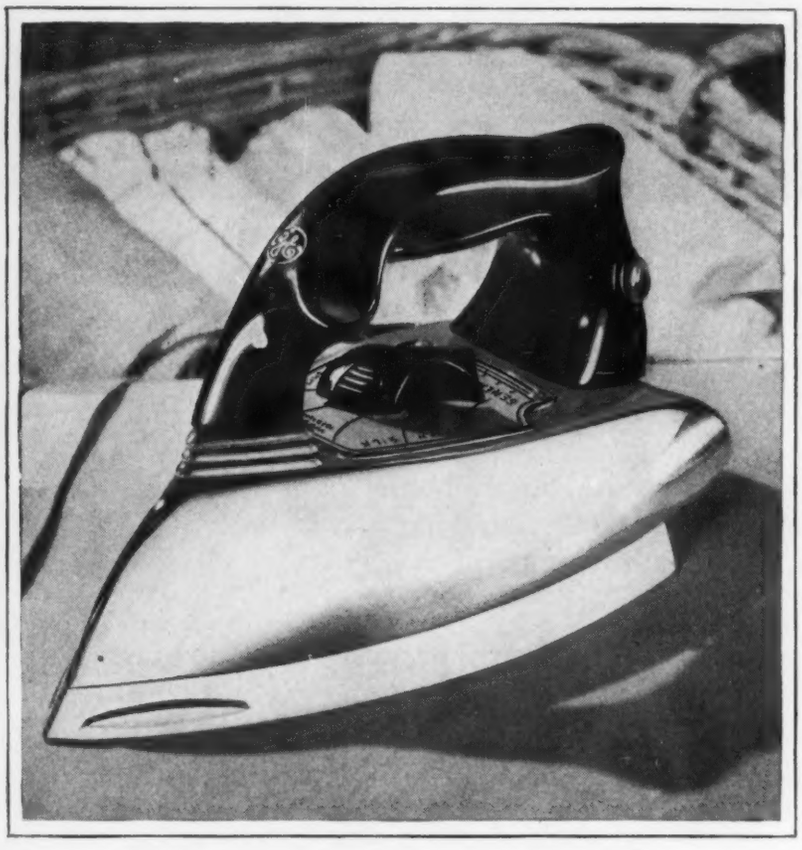
Railley
CORPORATION · CLEVELAND, OHIO
ORIGINATORS OF THE
PIN-IT-UP LAMP

America's fastest-selling iron is the G-E "Dial the Fabric" Iron

Know the iron that moves fastest from your counters to your customers? Just scan the *preference* picture . . . and instantly you'll see General Electric "Dial The Fabric" Irons are America's quickest movers.

Why? Because surveys show that women prefer this *fully automatic* new G-E model—*by over 2 to 1!*

They find it cuts ironing time by as much as one third. They like it for its famous G-E *"light that says when."* They go for its light weight . . . its splendid balance . . . its over-all G-E ironing efficiency.



And don't you forget—for the women don't—that it's the *only* iron with *all* these features:

Exclusive Calrod Unit heats up faster. Cast in a big 27-square-inch aluminum sole plate that helps speed up ironing!

G-E "Dial The Fabric" Control selects and keeps the right heat for every fabric!

Double Button Nooks make it easy to iron around and under buttons!

Built-in Thumb Rest relieves muscle strain; molded handle stays cool!

Millions hear the story every month!

G-E promotion with sales-pull *plus* is pushing this automatic iron in every corner of the United States.

It's a story that can't miss with appliance-hungry housewives today . . . a story that reaches millions of women *every month* in top-circulation magazines. And remember, G-E is the *only* appliance manufacturer that promotes sales of Irons, and other products, with a 5-days-a-week radio program—"The G-E House Party" with Art Linkletter, over CBS at 4 P. M., E. S. T., Monday through Friday.

Now's your chance to add *your* voice to selling these sales features of the G-E automatic iron . . . and capitalize on that already-vast market eager to buy it! General Electric Company, Appliance and Merchandise Department, Bridgeport, Conn.

Everything electrical for better living in your home

GENERAL ELECTRIC

In order to release items essential to the speedy reconversion of all lines of industry and business, Calship is placing on sale immediately all surplus materials, equipment, tools and facilities used in its wartime construction of ships.

Everything in this huge, 14-way shipyard at Terminal Island is to be sold. There are a total of nearly one-half million individual items, covering 18,000 classifications. Many of them are difficult or impossible to buy.

WIDE CHOICE OF MATERIAL

In addition to metal working tools and equipment of every category, there are surplus materials consisting of all types of shipbuilding items such as turbines, gears, generators, etc.; steel plates and shapes, pipe fittings, valves, and all other types of ship materials in large quantities and all sizes.

QUANTITY BUYERS PREFERRED

To facilitate the handling of this tremendous stock of materials, sales will be limited to those prepared to make quantity purchases. There will be no bidding. All prices are fixed and f.o.b. Terminal Island. No red tape stands between purchase and delivery. Material and equipment is being sold *as is*.

For Details Write or Wire:

Industrial Equipment Company, Care of California Shipbuilding Corporation, P. O. Box 966, Wilmington, California.

Exclusive Sales Representatives for . . .

SURPLUS MATERIALS, EQUIPMENT, MACHINERY, TOOLS, and PLANT FACILITIES OF CALSHIP'S GREAT SHIPYARD

500,000 ITEMS FROM NUTS AND BOLTS TO GANTRY CRANES

TYPICAL ITEMS

ELECTRIC WELDING MACHINES

ELECTRIC DRIVEN TOOLS

ELECTRICAL TESTING EQUIPMENT

POLE LINE HARDWARE

FLOODLIGHTS

ALL TYPES OF ELECTRICAL MATERIALS

SHIPS ELECTRICAL MATERIAL

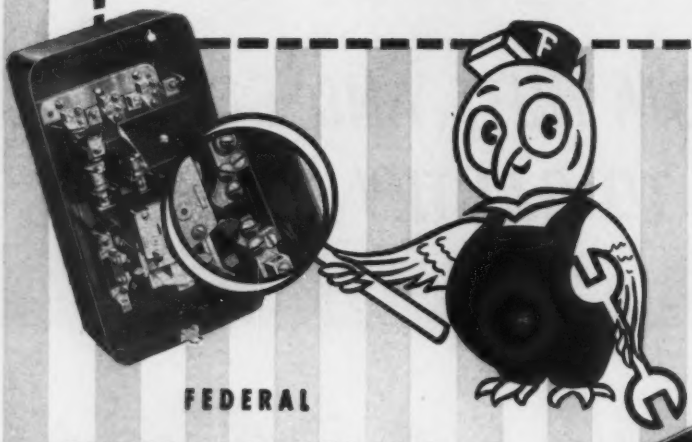
WIRE

CABLE

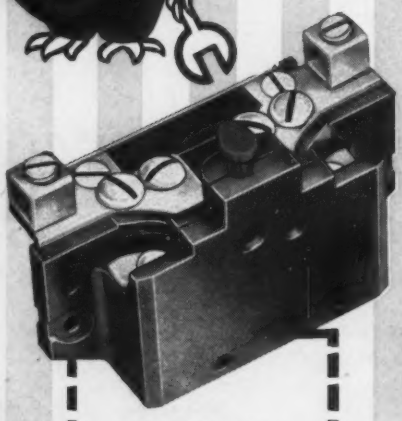
SWITCHES & SWITCH BOARDS

CALIFORNIA SHIPBUILDING CORPORATION

FOR FOOL-PROOF SAFETY EVERY TIME
IN CUTTING MOTORS FROM THE LINE,
THIS FEDERAL RELAY DOES THE TRICK
WITH THOSE WHO KNOW—
IT'S BOUND TO CLICK!



FEDERAL
OVERLOAD RELAYS
STANDARD EQUIPMENT ON



Federal NOARK
MAGNETIC
MOTOR STARTERS

Wherever overload protection is needed . . . whether on new or existing installations . . . Federal's Overload Relays will provide the "plus-margin" of dependability generally associated with Federal products. Naturally, these relays are built into Federal Noark Magnetic Starters . . . but remember, too, that they're available for your special applications. Federal Overload Relays provide conveniently located load and control circuit terminals, often making additional terminal blocks unnecessary.

DESIGNED FOR AUTOMATIC OR MANUAL RESET

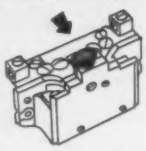
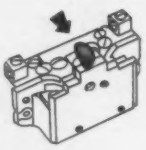


Diagram shown above illustrates Plunger (arrow) set for "automatic" reset.



Plunger is set for "hand" reset in above diagram.

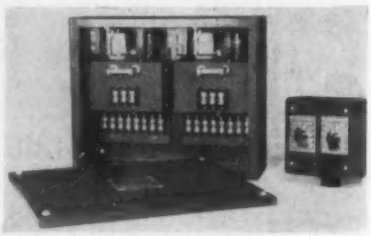
FEDERAL ELECTRIC PRODUCTS COMPANY, INC.
EXECUTIVE OFFICES: 50 PARIS ST., NEWARK 5, N. J. • PLANTS: HARTFORD, CONN. • NEWARK, N. J.

Sterilamp for Dairy (210)

A U-shape Sterilamp, claimed to reduce the bacteria count in washed milk cans 96% in one minute, is being manufactured by Westinghouse. The tube is suspended on springs inside a protective steel cage and is said to consume less energy than a 25-watt light bulb.

Repeat-Cycle Timer (211)

A repeat-cycle timer has been added to the Photoswitch line, and is recommended by the manufacturer for applications requiring two adjustable timing periods to run in a continuous cycle. The cycle is initiated by either momentary or sustained contacts and automatic recycling is provided. Each timing period is adjustable from 1/20 second to two minutes. This timer, type 2T15U, is for 115 volts a-c or d-c. Output connections are those of a single-pole, double-throw switch for normally open and normally closed operations. Contacts are 1,000 watts, 115 to 600 volts a-c, 500 watts, 115 to 220 volts d-c. It is designed so that either momentary or sustained contacts will control the timing interval.



Varnish (212)

John C. Dolph Co. has announced No. 238 black air drying varnish of a non-pigmented formulation. In ASTM tests, flexibility life was found to be over 1,000 hours. Other tests have shown the material to be oilproof immediately after setting up, the announcement states. Wet dielectric strength is more than 600 volts per mil and dry dielectric more than 1,300 volts per mil. For reduction purposes Mineral Spirits may be used.

Wide-Beam Refractor (213)

G-E has announced that it will furnish with all its Form 79R luminaires, a new wide-beam refractor, designed to improve illumination on streets more than 30 ft. wide. This refractor projects the center of the beam about 14° out from the curb, as compared with the 5° angle of the old refractor. Lifting prisms are provided at the bottom of the unit to make the entire refractor appear to be full of light.

PRISONER OF THE PAST

...until **ADEQUATE WIRING** Frees it!

An industrial building may look enough . . . may *be* big enough to take care of tomorrow's suddenly stepped-up demands for greater output. Yet, if it isn't "big enough" electrically . . . hasn't the Adequate Wiring for full electrical efficiency, it is shackled to the past, held down to an outworn, outdated production quota.

Adequate Wiring, however, is more than a reservoir for future needs. It means not only conductors of ample size — but enough circuits and the kind of electrical system that can supply all the needs of power and lighting (both present and future) *at the lowest cost per kilowatt used.*

In existing factories, office buildings and other industrial structures, this lower power cost may take various forms. It may appear in reduced voltage drop when skimpy wire sizes are replaced. It may show substantial economies when high voltage cables are used and when unit sub-stations are erected at load centers. It may result in savings through power factor correction when full advantage is taken of synchronous motors and capacitors.

And in new buildings, only Adequate Wiring can forestall the need for wasteful, work-delaying dismantling operations in the future. Let an Okonite engineer work with you in planning Adequate Wiring and in applying its benefits to buildings now in use or soon to be erected.

The Okonite Company, Passaic, New Jersey.

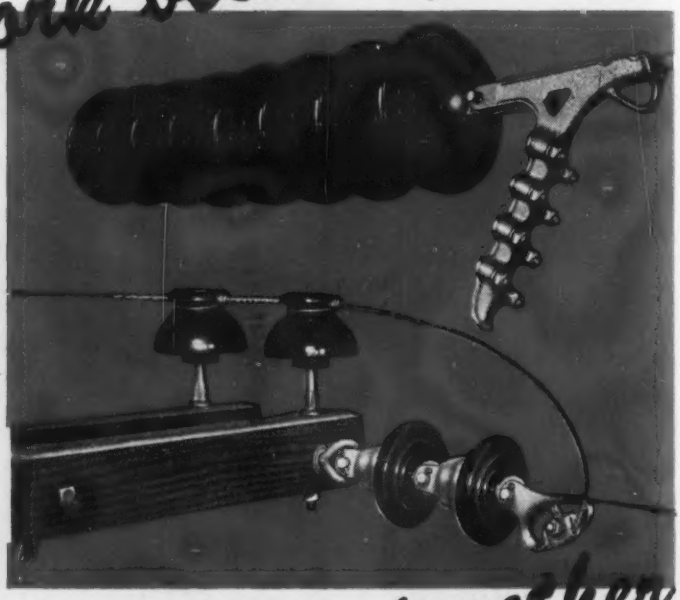
OKONITE

OKONITE SINCE 1878

insulated wires and cables for adequate wiring at its best

4355

PARTS that work best together



Produced by MEN working together

Only with O-B insulation and hardware can you get this unique combination--conception, engineering, design, and manufacture "all under one roof". Insulators start from the basic clays; hardware from the basic metals. Potteries, founderies, forge and machine shops work under one direction and toward only one goal --balanced characteristics in the job of supporting a charged conductor, and an over-all responsibility for doing this job well. And with this responsibility goes a broad knowledge of requirements not restricted to an interest in only part of the task.

Backed by ample proof is the fact O-B consistently holds its place for lowest depreciation rates. There is no one big reason why--it's a lot of small reasons resulting from *men* working together making *parts* that work best together. This point of view, and the facilities to make it work, are an intangible element of every piece of O-B material--and only O-B!

Ohio Brass

2642-H

MANSFIELD, OHIO, U. S. A.

CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONTARIO

CENTRAL
RIGID STEEL
CONDUIT

"There's Tested Strength in Every Length"

The excellence of its past performance assures its future demand.

SPANG-CHALFANT

Division of The National Supply Company

General Sales Office: Grant Building, Pittsburgh 30, Pa.

District Offices and Sales Representatives in Principal Cities

CHANCE
Tips Grounding Sets for Every Overhead and Substation Requirement

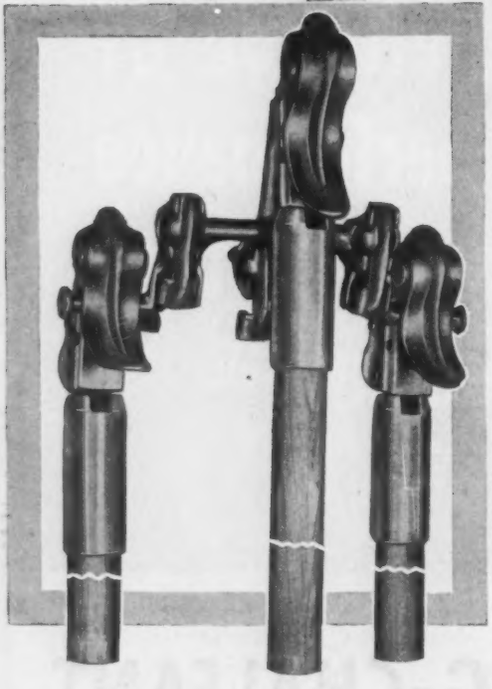
Dependable Protection on all types of jobs—For Single-phase Lines up to Heavy Substation Bus Bars

For ample protection to linemen making repairs on "cold" lines, Grounding Equipment should make tight contacts at all points—maintain high conductivity and provide insulation protection during application. You get all this in every type and size and a few plus features, when you specify Tips Grounding Equipment.

Single clamps or combination sets are available for all types of high-line or substation work with mechanical and electrical characteristics to meet every requirement. Clamps or clusters of clamps may be obtained, either mounted on poles or unmounted, for application with clamp sticks. This equipment is designed by experts and thoroughly tested to provide the protection that your linemen should have against unexpected current surges.

The clamps snap on with minimum arcing and screw up tight on the conductor by turning the poles or eye screws. Jumper pressure contacts are pre-tightened with a wrench. There are no loose contacts as when hazardous grounding chain is used. All parts are carefully tested to meet high Safety Standards. All poles are laminated for strength and tested to resist 75,000 volts per foot.

Complete details on Chance-made Tips Grounding Equipment will be found in the grounding section of your Tips Tool Catalog No. 8.



Substation Bus Bar Clamps and combination sets are made in varied types and sizes for flat or round bus bars. The eye screw clamps at right have removable bronze inserts that make them adjustable to fit a number of different sized bus bars. These, too, are available either mounted or unmounted.

"THERE'S NOTHING TOO GOOD WHERE LIFE IS AT STAKE"

ABC INDUSTRIES

A·B·CHANCE CO·

CENTRALIA · MISSOURI

VACUUM CLEANERS · WASHING MACHINES · ELECTRIC FANS
SEWING MACHINES · ELECTRIC DRILLS · ELECTRIC RAZORS
FOOD AND DRINK MIXERS · REFRIGERATORS · POWER SANDERS
PHONOGRAPHS · ELECTRIC SAWS · CIRCULATING MACHINES
VACUUM CLEANERS · WASHING MACHINES · ELECTRIC FANS
SEWING MACHINES · ELECTRIC DRILLS · ELECTRIC RAZORS
FOOD AND DRINK MIXERS · REFRIGERATORS · POWER SANDERS
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VACUUM CLEANERS · WASHING MACHINES · ELECTRIC FANS
SEWING MACHINES · ELECTRIC DRILLS · ELECTRIC RAZORS
FOOD AND DRINK MIXERS · REFRIGERATORS

An Invitation

to makers of fractional-horsepower motor appliances!

MANY manufacturers have solved their fractional-horsepower motor brush problems for their new appliances simply by putting it up to National Carbon Company's brush-testing laboratory.

We invite you to do the same! This will relieve you of making countless and costly "elimination tests." And it will assure application of the most suitable brush grade for your motor.

You can rely on this service because National Carbon has been working out brush problems of every conceivable type for over 50 years. In addition, National Carbon's modern laboratory for testing fractional-horsepower motor brushes is equipped with the latest in test facilities, and is staffed by experts.

Moreover, your tests will be run as you would run them yourself — under your own specified load, cycle, and other operating conditions.

Accept this invitation! It can mean better performance for your appliances. Send in your motors — tests will be made promptly. Naturally, there is no obligation.

If you wish more information on these tests, get in touch with our nearest Division Office.

Here is the modern laboratory where your brush problem can be solved quickly, correctly... at a big saving in trouble for you!

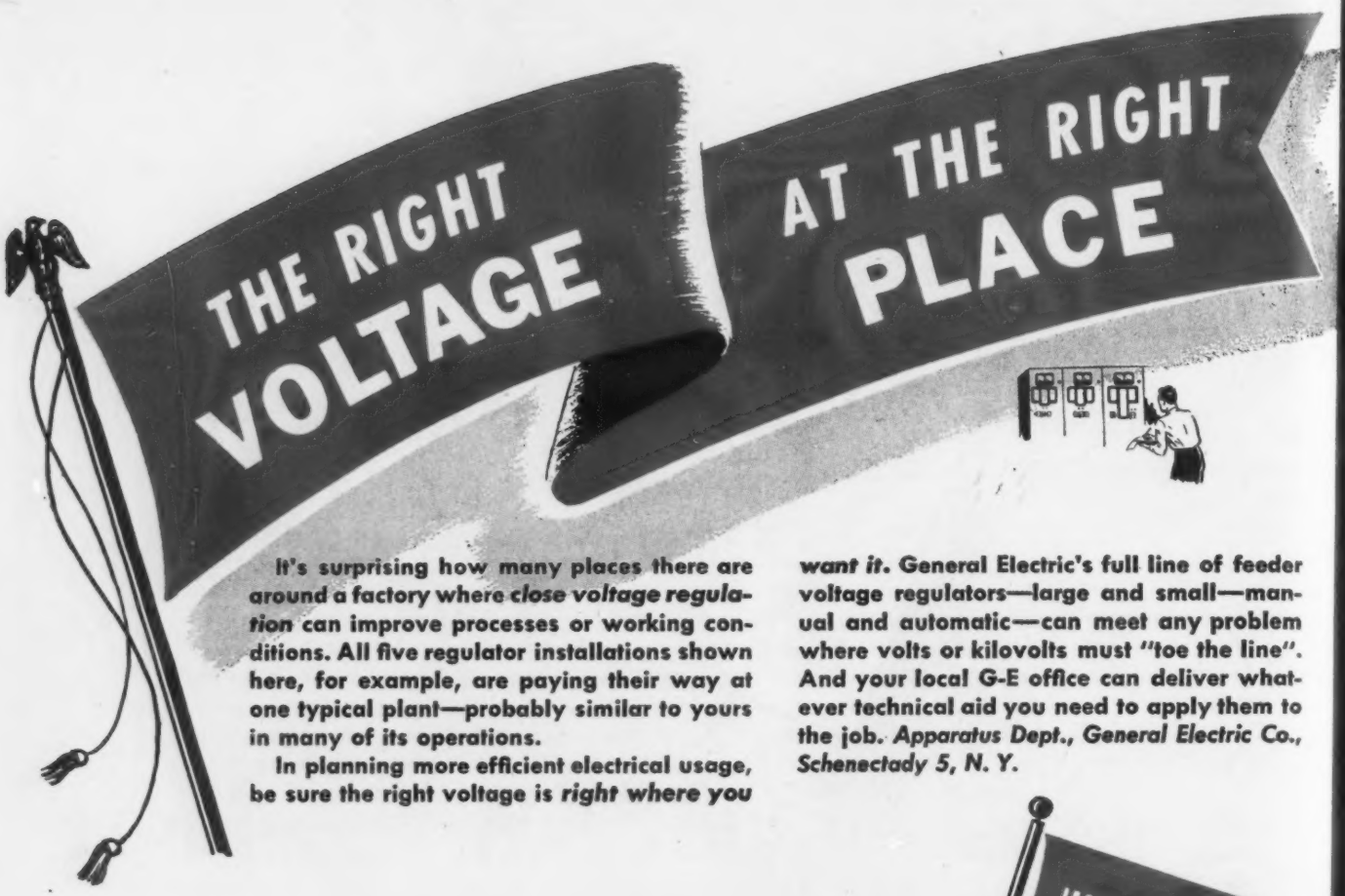
The word "National" is a registered trade-mark of

NATIONAL CARBON COMPANY, INC.

Unit of Union Carbide UCC *and Carbon Corporation*

GENERAL OFFICES: 30 East 42nd Street, New York 17, N. Y.

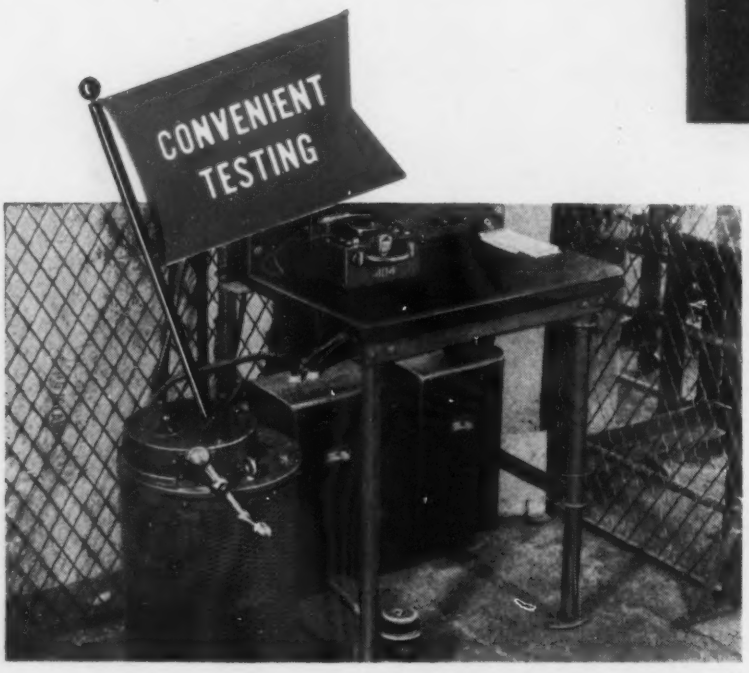
DIVISION SALES OFFICES: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco



It's surprising how many places there are around a factory where *close voltage regulation* can improve processes or working conditions. All five regulator installations shown here, for example, are paying their way at one typical plant—probably similar to yours in many of its operations.

In planning more efficient electrical usage, be sure the right voltage is *right where you want it*. General Electric's full line of feeder voltage regulators—large and small—manual and automatic—can meet any problem where volts or kilovolts must "toe the line". And your local G-E office can deliver whatever technical aid you need to apply them to the job. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*

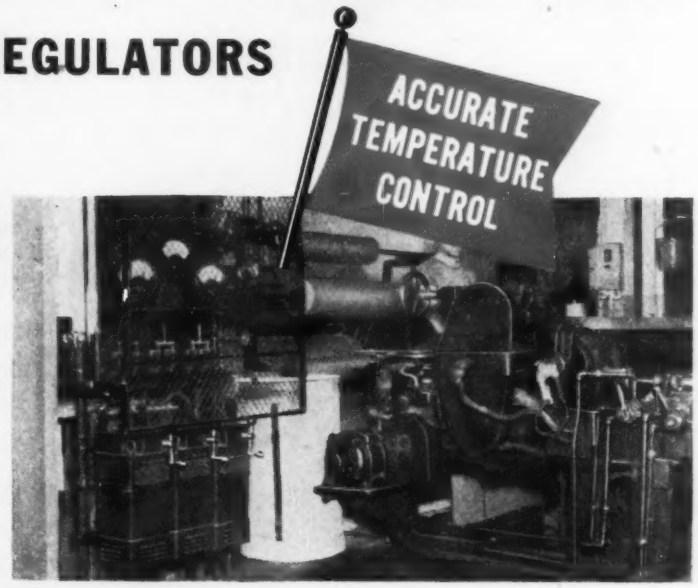
1 These dry-type induction voltage regulators are used to control temperature of a wire-annealing operation. Twelve strands are processed simultaneously, each regulator acting to control the current-flow through series-connected sections of two conductors. These hand-operated regulators make it easy to adjust for different conductor sizes and other changes in operating conditions.



2 Smooth, stepless voltage control for 100,000-volt testing equipment is provided by this 5-kva dry-type induction voltage regulator. Connected in the primary (low-voltage) side of the step-up transformer, this regulator affords 100 per cent raise-and-lower regulation, so that output test voltage can be varied from 0 to 100 kv, simply by turning the crank.

...PAYS OFF 5 WAYS AT A SINGLE PLANT

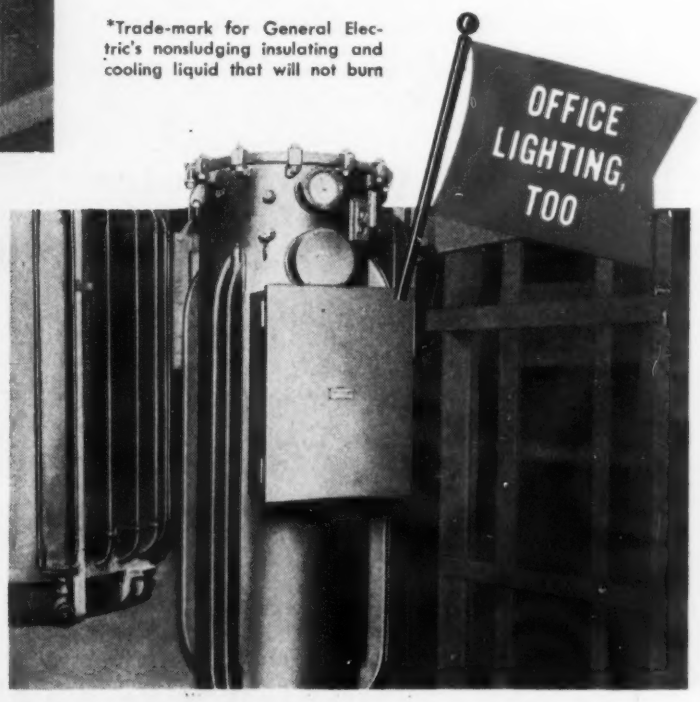
USING G-E VOLTAGE REGULATORS



3 Electric heating circuits on a hot-rolling press used to fabricate laminated plastic forms are maintained at the required temperature with induction voltage regulators. Circuits for two electrically heated rollers and one hot plate are separately controlled by the hand-operated regulators, giving close control of processing.

4 Automatic voltage regulation by means of this dry-type induction regulator has "paid off" in a more uniform level of illumination. The full visual value of every kw-hr is obtained with fewer lamp burn-outs from overvoltage. Production space is saved by locating the regulator on a platform along with the Pyranol* transformer which serves the lighting circuits.

*Trade-mark for General Electric's nonsludging insulating and cooling liquid that will not burn



5 This 48-kva Pyranol induction voltage regulator, installed in a basement substation, automatically maintains the proper voltage for lighting circuits in the plant office building. A Pyranol regulator was chosen for its safety in this confined indoor location.

For complete information on any of General Electric's voltage regulation equipment, write for the following publications:

Oil-immersed Induction Voltage Regulators—Type IRS
GEA-2018 (24 kva and smaller)
GEA-2985 (36 kva and larger)
Pyranol Induction Voltage Regulators—Type IRS, GEA-3443
Dry-type Induction Voltage Regulators—Type AIRS, GEA-3057
Inductrols (Small Dry-type Induction Voltage Regulators)
GEP-238
Automatic Voltage Stabilizers GEA-3634
Variable-voltage Autotransformers GEA-3635

GENERAL ELECTRIC

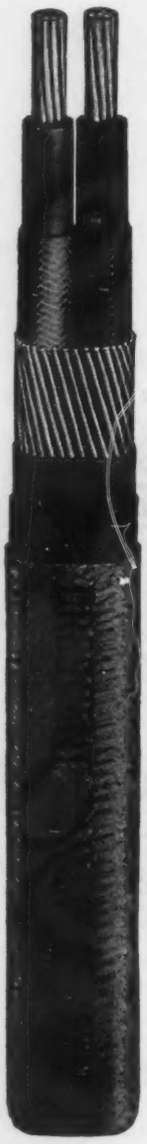
404-38-5409

CRESCENT SERVICE CABLES

Employ
Heat Resisting Insulation

- ***ALL* CRESCENT Service Cable is insulated with a Type RH, super-aging, heat-resisting rubber compound of the best grade obtainable that gives *35 to 44% greater current carrying capacity* than ordinary code grade insulated service cable.***
- **Service cable is the bottleneck limiting the amount of customer demand for all appliances, and future business for the contractors, dealers, wholesalers and power suppliers.**
- **With CRESCENT SERVICE CABLE you get maximum load capacity, long life and value. Made in Type SE, Style U, as shown; Style A with a galvanized steel armor tape over the bare neutral conductor, and in type SD, Drop Cable. Sizes—No. 12 to No. 2 AWG in two and three conductors.**

* Based on 1940 N.E. Code.



Available through Electrical Wholesalers

CRESCENT
WIRE AND CABLE

NEMA

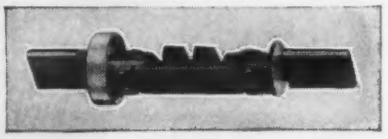
CRESCENT INSULATED WIRE & CABLE CO.
TRENTON, N. J.

Brazing Sets (214)

Brazing sets for operation on a 220-volt power source are being produced by Westinghouse in 5-, 10- and 20-kva. sizes. Essentially the set consists of a transformer, voltage selectors, controls and carbon-tipped tongs. The high currents flowing through the carbons bring them to incandescence, quickly raising the material to brazing temperatures of from 1,200° to 1,500° F. The 5- and 10-kva. units are air-cooled; the 20-kva set is fan-cooled and has a self-contained water cooling and recirculating system used to cool the brazing cables and tongs. The smallest unit weighs about 30 lb.; the next 100 lb. and the largest, 250 lb. Corresponding secondary currents are 625, 833 and 1,667 amp.

Renewable Fuses (215)

Jefferson Electric Co. has improved its renewable fuses with a new construction designed to allow for contraction and expansion between fuse barrel and link assembly. In place of permanently securing the ends of the horn fiber bridge, the new link assembly design permits sufficient freedom of motion to avoid unbalanced strains, according to the manufacturer's announcement.



Arc Furnace Regulators (216)

Westinghouse has added two types of arc furnace regulators, a rotating regulator of the Rototrol type and an electronic control. These units and the balanced beam regulator do the same fundamental job but have particular characteristics. The rotating unit consists of a small three-machine motor-generator-motor set with special interrelated fields that cooperate to give amplification of the control indication and precision of control. The electronic regulator uses dry type rectifiers to secure a measure of arc current and voltage. These outputs are amplified and impressed upon thyratron tubes, the d-c output controlling the electrode motors.

Hardness Tester (217)

A magnetic hardness tester has been designed by General Electric for metal parts too small to be production-tested with mechanical type hardness testers, and for spot checking of hardness in large sheets or lengths of steel wire. Operation is based upon the correlation of hardness and coercive force in magnetic materials. Pieces of unknown hardness are checked against a specimen of known hardness by comparing the relative strength of the magnetism produced under the same conditions. This test will distinguish differences of two points on the Rockwell "C" scale without damage to the piece tested, it is stated.

Street Light Control (218)

Ripley Co. has a new street lighting control, which it claims will provide, under ideal conditions of daylight, a minimum "lights on" period from 25 minutes after sunset to 25 minutes before sunrise. Adjustment is provided to meet customers' specific requirements. Over-all dimensions are 9⅜ x 4⅛ in. diameter. Weight is 4½ lb.

You can't beat the *Nicopress* method of making Dead-ends

1. They are designed for use on copper, Copperweld and Copperweld-copper conductors.
2. They can be installed on pin, strain or spool insulators.
3. Simplicity and speed of installation.
4. Strength and tightness.
5. Provide for tail of any desired length.
6. No extra tools are required to make the offset dead end, as the same tool used in making regular line splices will do the job . . . These convenient Nicopress tools are small and compact and are extremely easy to operate close to the insulators or cross arms.
THE NATIONAL TELEPHONE SUPPLY COMPANY
The National Telephone Supply Company
5100 SUPERIOR AVENUE • CLEVELAND 3, OHIO
Canadian Mfr.: N. SLATER CO., LTD., HAMILTON, ONTARIO, CANADA
Export Distributor: INTERNATIONAL STANDARD ELECTRIC CORP., NEW YORK, N. Y.

One of a fleet of 35 FWD now serving The Pacific Gas & Electric Co., San Francisco, California

Service in the western mountain region is tough on utility trucks . . . but FWDs continue to prove that no utility service is too tough for these rugged Four-Wheel-Drive Trucks.

The FWD Model "HA" Line Construction and Maintenance Truck shown above recently entered the service of the California Water and Telephone Co., Telephone Division, Los Angeles. Equipped with an FWD Utility V-10 Line body, single drum winch and LM type pole derrick, this Four-Wheel-Drive Truck is ready for the most difficult duty . . . and can be depended upon to "make good".

It will get crews and equipment to location, on or off the highways, through sand, mud, or over rugged mountain terrain . . . because the FWD principle puts more power and traction on all four wheels, is safer on slippery roads and dangerous curves, and faster up-hill or down (with safety). Rugged construction and balanced weight distribution on all four wheels provide economy in oil, gas, tires and replacements. The fact that more than 200 utilities now use FWDs, proves the value of these trucks for line construction and maintenance work.

AVAILABLE NOW . . . *See your nearest authorized FWD dealer . . . or phone, wire or write.*

FWD

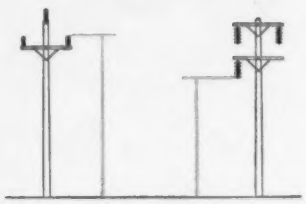
THE ORIGINAL EXCLUSIVE BUILDERS OF FOUR-WHEEL-DRIVE TRUCKS

THE FOUR WHEEL DRIVE AUTO CO.,
Clintonville, Wisconsin

Canadian Factory: **KITCHENER, ONTARIO**

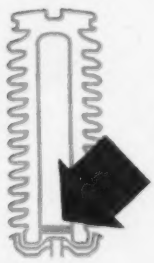
FWD Distributors: ARIZONA—Arizona-Cedar Rapids Co., 401 N. First St., Phoenix; CALIFORNIA—The Four Wheel Drive Auto Co., 1339 Santa Fe Ave., Los Angeles 21 and FWD Pacific Co., 469 Bryant St., San Francisco 7; COLORADO—Liberty Trucks & Parts Co., P. O. Box 1889, Denver 1; IDAHO—Intermountain Equipment Company, Broadway at Myrtle St., Boise; MONTANA—Stefteck Equipment Co., 11 E. Cutler St., Helena; NEVADA—Allied Equipment Co., Reno; NEW MEXICO—The Myers Company, Las Cruces; OKLAHOMA—Halliburton Oil Well Cementing Co., P.O. Drawer 471, Duncan; OREGON—Feenaughty Machinery Co., 112 S. E. Belmont St., Portland 14; UTAH—Cate Equipment Co., 49 E. 9th So., Salt Lake City; WASHINGTON—Feenaughty Machinery Co., 1028 6th Ave., So. Seattle 2, Glenn Carrington & Co., 91 Columbia St., Seattle and Feenaughty Machinery Co., 715 N. Division St., Spokane; WYOMING—Wortham Machinery Co., 517 W. 17th St., Cheyenne; ALASKA—Glenn Carrington & Co., Nome, Fairbanks, Anchorage. Graybar Electric Company—offices in principal cities.

LINE POST CONSTRUCTION IS ECONOMICAL FOR CONVERSION TO HIGHER VOLTAGES *OR* NEW BUILDING



Any still-sound transmission line can be converted to higher voltage at low expense—and economically of manpower—by reinsulation on Line Posts. Ordinarily only new cross-arms and insulators are needed, and the job can be done with hot-line tools or during low-demand hours. For new construction, Line Posts offer substantial advantages in cost and operating performances. Because of the Line Post's upright height, it provides extra ground clearance —or in some cases the opportunity to use poles of the next shorter length.

LAPP *LINE POSTS ARE LONG-LIVED... ALL HARDWARE EXTERNALLY ATTACHED*



A feature of the Line Post in the original Lapp design was the *external attachment of all hardware,* and the elimination of nested porcelain parts. An inherent characteristic of porcelain is that it is at least ten times as strong in compression as in tension. Much of the failure from cracking in conventional insulators comes from bursting tension forces induced by thermal change. Lapp considers that its original conception was sound, and offers Line Post and Station Post insulators with all hardware externally attached—and still claims "*no cracking*" as a feature of these units.

Lapp

LAPP INSULATOR COMPANY, INC., LE ROY, N. Y.

America's smallest diameter, lightest weight rubber covered wire

Conventional insulated wire, four No. 14 (code) type R conductors. 3450 watts.

Laytex insulated wire, eight No. 14 Laytex insulated conductors — 5800 watts.

A well lubricated fibrous cover protects Laytex against light, air and abrasion. Cover is also flame-retardant, moisture-resistant.

UNITED STATES

ADEQUATE WIRING — THE KEY TO THE HOME OF TOMORROW — SERVES AND SAVES

NOW INCLUDED IN NATIONAL ELECTRICAL CODE

Here's the news contractors, engineers and architects have long been waiting for! Laytex, the revolutionary building wire that doubles conduit capacity, has now earned its right to be used not just on re-wiring jobs, but for *every* kind of wiring. On new and old construction, Laytex — America's smallest diameter, lightest weight rubber covered wire — means savings in weight, savings in conduit space, plus unexcelled tensile strength and elongation.

Produced by the exclusive "U. S." process of continuous dipping, drying and vulcanizing, Laytex Wires and Cables have perfectly centered conductors, insulated with 90% unmilled grainless rubber having high dielectric strength.

The man who uses Laytex will find it clean stripping, easy to install or remove. Permanent colors make circuit identification easy.

U. S. ELECTRICAL WIRES AND CABLES

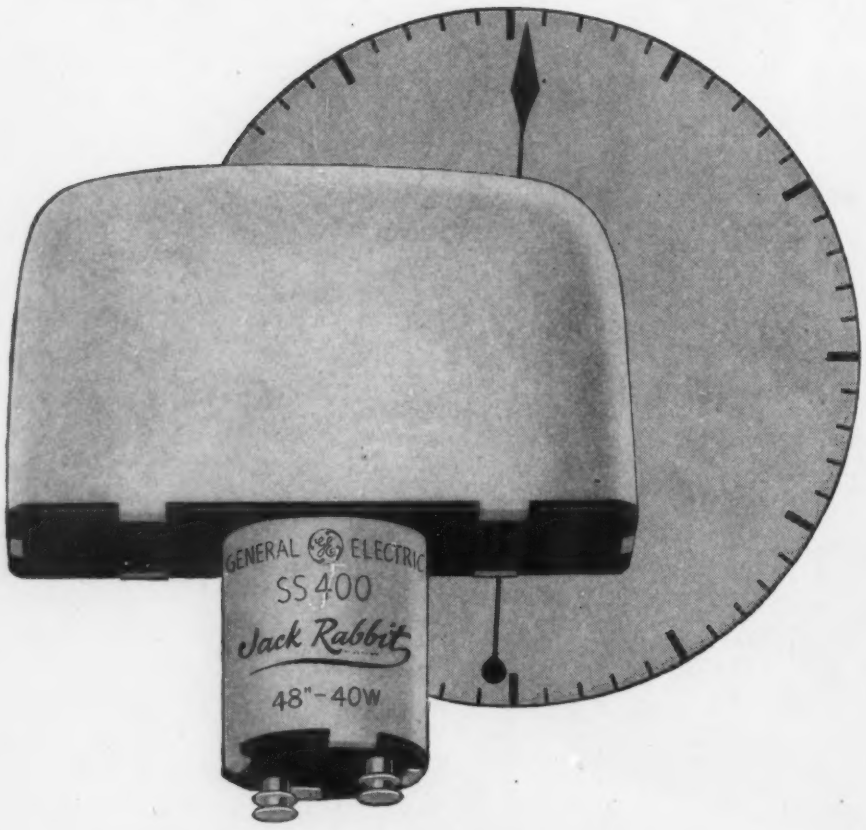
Listen to "Science Looks Forward"—on the Philharmonic-Symphony program. CBS network, Sunday afternoons, 3:00 to 4:30 E. S. T.

Serving Through Science

RUBBER COMPANY

1230 AVENUE OF THE AMERICAS • ROCKEFELLER CENTER • NEW YORK 20, N. Y.

FOR A SPLIT-SECOND START



Equip Fluorescent Fixtures With G-E Jack Rabbit Starters

REG. U.S. PAT. OFF.

With the new G-E Jack Rabbit installed in your fluorescent lighting system, you have the advantage of split-second starting and protection against blinking for 40-watt fluorescent lamps. On top of that you have economy of operation. The Jack Rabbit, which is for use with conventional low cost ballasts, provides approximately 13 per cent greater over-all operating efficiency than high-voltage instant-starting ballasts.

This combination of features is exclusive with the Jack Rabbit, which is the reason why this new starter has attracted wide interest wherever fluorescent lighting is used. Your system will be improved and modernized with the Jack Rabbit — its quick, efficient starting and protection against dead lamp flickering are benefits of direct value to you.

For additional information about the Jack Rabbit write to Section G261-18, Appliance and Merchandise Department, General Electric Company, Bridgeport, Connecticut.

GENERAL ELECTRIC

Mercury-Vapor Lamp (219)

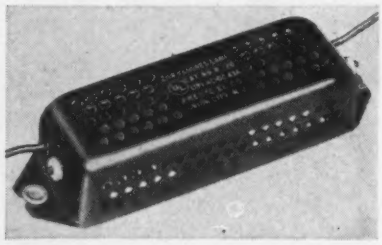
Westinghouse has announced a new 60-000-lumen mercury-vapor lamp, which it states has greater efficiency than previous lamps of this type, due to increase in pressure of the mercury vapor. The new lamp has a mogul-screw base and is not restricted in burning position. It is created in an arc stream about the shape and diameter of a cigarette and about twice as long. It is enclosed in a quartz housing, which is surrounded by a hard glass exterior. Over-all size is 14 in. long and less than 4 in. in diameter.

Street Lamp (220)

Westinghouse has a new street lamp with a reflector design which embodies a deep oval indentation. The lamp, instead of projecting below the plane of the reflector, is mounted up in the oval hollow. According to the manufacturer, no light is thrown above the horizontal and the bare bulb cannot be seen by motorists more than 200 ft. away. It is also claimed that about 60% more light falls on the roadway than with previous open type lamps.

Resistor Ballast (221)

Presto Electric Co. is making a resistor ballast for use with 15- and 20-watt fluorescent lamps, a-c or d-c, 118 volts. This ballast is air-vented, weighs 8 oz., is 1¼ in. high, 6⅛ in. long, 1⅞ in. wide, with 10-in. AF asbestos covered leads, according to the announcement. It is finished in black.



Rectifier (222)

Benwood-Linze Co. has announced a self-cooling dry disc metallic rectifier. It is rated 50 amp. for 6-volt automotive battery taper charging. Two rectifiers may be operated in parallel from separate transformer secondaries to provide 100-amp, maximum charging rate without a fan, the announcement states.

Transmitting Triode (223)

An improved 833A transmitting triode in the high-power classification has been developed by Taylor Tubes. Similar in most respects to the conventional 833A, the new tube contains a zirconium-coated anode with the zirconium coating sprayed only on that part of the plate which is most subject to heat during operation, according to a recent announcement.

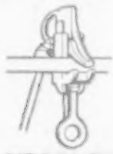
Hedge Trimmer (224)

The new model electric hedge trimmer manufactured by Kaufman Mfg. Co. has double-action blades, a duo-position cutting head which may be locked in two different positions, a 10½-in. cut, is powered by a Universal motor for use on d-c or a-c. Weight is approximately 5 lb.

Better Construction Today—
Less Maintenance Tomorrow

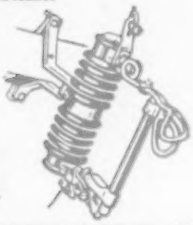
KEARNEY SURE-LOK CLAMP STICK

Is simple and easy to operate. Can be used on all styles of eye screw clamps.



KEARNEY PROTECTED THREAD CON-NEC-TAP CLAMPS

Make line connections that stay tight. They are small, yet rugged and corrosive resistant.



KEARNEY TRIP-OUT FUSE CUTOUT

Provides positive reliable protection. They save on operating costs. Available in ratings 5000 to 69,000 V. —100 to 200 Amp.

KEARNEY CON-NEC-TITES

Provide positive, permanent, solderless line connections. Fast and easy to use —reduce costs.

KEARNEY PRODUCTS

MADE BY **JAMES R. KEARNEY CORPORATION** 4236 CLAYTON AVENUE SAINT LOUIS 10, MISSOURI

Freddy Firefly points with pride

to the new

Firefly HI-LITE

A beautiful horizontal fixture built to the exacting standards of this famous line . . . modern . . . competitively priced . . . highly streamlined . . . skillfully engineered . . . easily installed in pendant hanging . . . flush to ceiling or continuous rows.

- Deliveries are now good.
- Our definite policy of selling only to accredited Electrical Wholesalers affords complete protection.
- All inquiries from contractors are referred to their nearest jobbers or to our sales representatives.
- Send today for our new FIREFLY catalog with price lists.

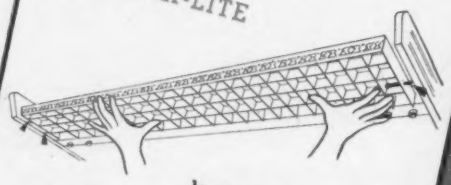
West Coast Representatives:

FRED G. CHEMNITZ
1310 Southwest Alder Street — Portland 5, Oregon

WALLACE R. LYNN & ERIC F. CHEMNITZ
1355 Market Street — San Francisco 3, California

LYNN & CHEMNITZ, Harvey Hill, *Manager*
316 Commercial Street — Los Angeles, California

Changes to a SUPER HI-LITE



louvred unit with high degree light cut-off.

Simply altered, as shown, by ordering a set of SUPER louvres and side panels.

KAHN MFG. CO. INC.

2051 NORTH 19TH STREET MILWAUKEE 5, WIS.

Formerly Fluorescent Fixtures, Inc.

This is the kind of a job that TIREX cables are designed to do satisfactorily. Here is a picture of a cable taking real punishment. Mud, snow, water and abuse, — all of these factors are present and through it all TIREX keeps right on with its unfailing dependability to deliver the current that keeps vital construction machines in operation. TIREX is not sold on a "it must be pampered" basis. TIREX cables take all the tough jobs right in their stride and then ask for more.

The Selenium Rubber Armor which protects the conductors of all TIREX cables is the toughest, most wear-resistant jacket known for wires and cables. The next time you need portable cords or cables that can be depended on be sure you specify TIREX.

TIREX SELENIUM Rubber Armor

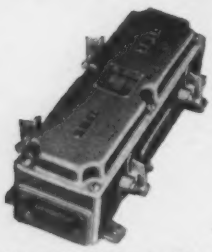
Simplex WIRES & CABLES

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.

CROUSE-HINDS

Panelboards and Distribution Centers

The illustrations show a representative selection from the dozens of different CROUSE-HINDS Panelboards—each designed for its own purpose.



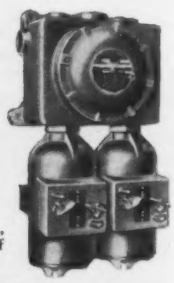
Type YSW Vaportight and Weatherproof Condulet with Four Circuit Breakers

Type DVS Dust-Tight Vaportight and Weatherproof Condulet with Two Circuit Breakers

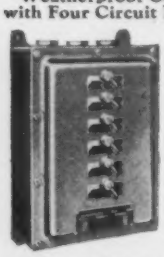
No. 6

of a series of advertisements which demonstrate that CROUSE-HINDS "complete line" means much more than just a range of sizes — there is a wide variety of highly specialized types in each classification.

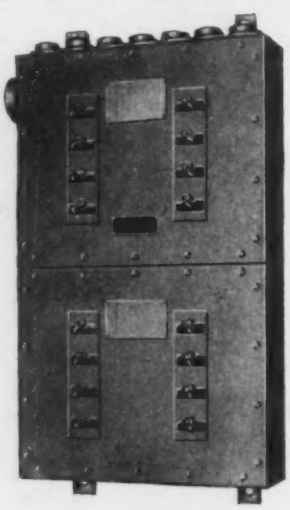
Type GUSC Explosion-Proof, Dust-Tight and Weatherproof Condulet with Two Circuit Breakers



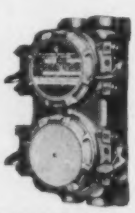
Type ESP Explosion-Proof, Dust-Tight, Vaportight and Weatherproof Panelboard with Four Circuit Breakers



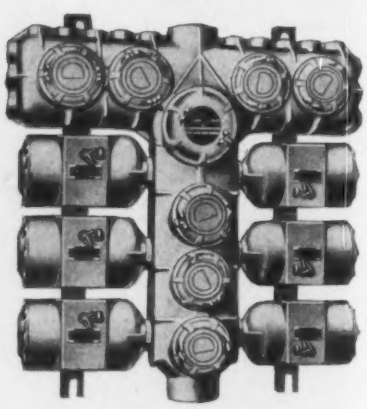
Type DVS Dust-Tight Vaportight and Weatherproof Condulet with Six Circuit Breakers



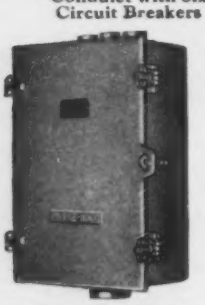
Type DVP Dust-Tight and Vaportight Panelboard with Sixteen Circuit Breakers



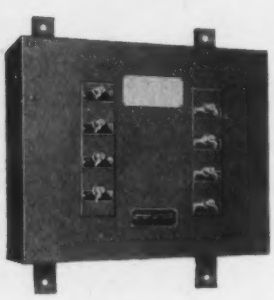
Type GUSC Explosion-Proof, Dust-Tight and Weatherproof Condulet with Four Circuit Breakers



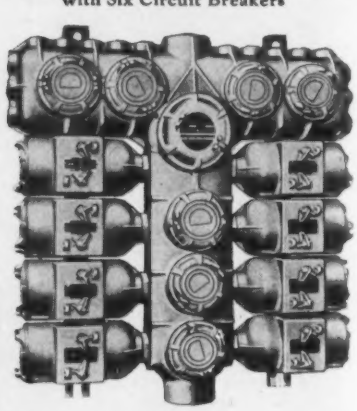
Type EDP Explosion-Proof, Dust-Tight, Vaportight and Weatherproof Panelboard with Six Circuit Breakers



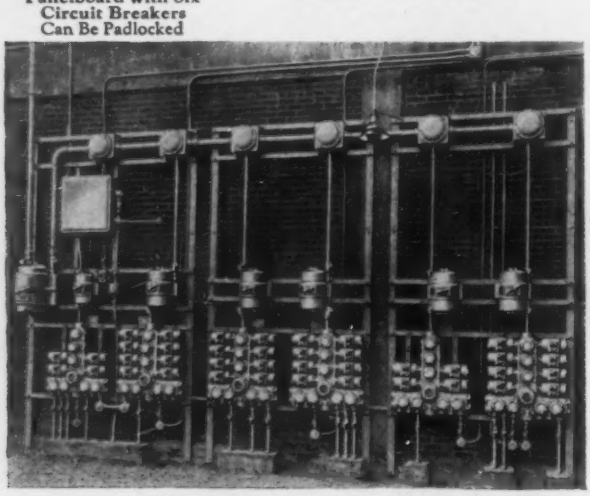
Type WBP Weatherproof Panelboard with Six Circuit Breakers Can Be Padlocked



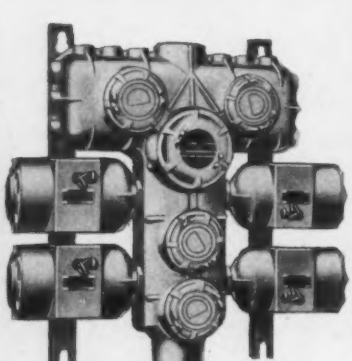
Type DVP Dust-Tight and Vaportight Panelboard with Eight Circuit Breakers



Type EDP Explosion-Proof, Dust-Tight, Vaportight and Weatherproof Panelboard with Sixteen Circuit Breakers



Explosion-Proof Distribution Center



Type EDP Explosion-Proof, Dust-Tight, Vaportight and Weatherproof Panelboard with Four Circuit Breakers

A Nationwide Distribution Through Electrical Wholesalers

Complete listings of each type are in Condulet Catalog No. 2500.

CROUSE-HINDS COMPANY

Syracuse 1, N. Y., U.S.A.

Offices: Birmingham — Boston — Buffalo — Chicago — Cincinnati — Cleveland — Dallas — Denver — Detroit — Houston — Kansas City — Los Angeles — Milwaukee — Minneapolis New York — Philadelphia — Pittsburgh — San Francisco — Seattle — St. Louis — Washington. *Resident Product Engineers:* Albany — Atlanta — Charlotte

CROUSE-HINDS COMPANY OF CANADA, LTD., *Main Office and Plant:* TORONTO, ONT.

CONDULETS · TRAFFIC SIGNALS · AIRPORT LIGHTING · FLOODLIGHTS

BETTER SERVICE WITH

SERVIT

the forged service connector

1. Forged for high strength, from high-strength, high-copper alloy.
2. High pressure between conductors assured by special low-friction bolt and nut alloys.
3. Extremely compact, for easy handling and taping.
4. Can be reused over and over again.
5. Wide conductor ranges . . . 13 sizes take from #10 solid to 1000 Mcm.
6. No special tools required.

Burndy SERVITS for both copper and aluminum cables, as well as other Burndy electrical connectors for use in maintenance and manufacturing are fully described in Catalog No. 41. Send for your copy, or, ask for engineering assistance on any special connector problem. Burndy Engineering Co., Inc., 107-V Bruckner Blvd., New York 54, N. Y.

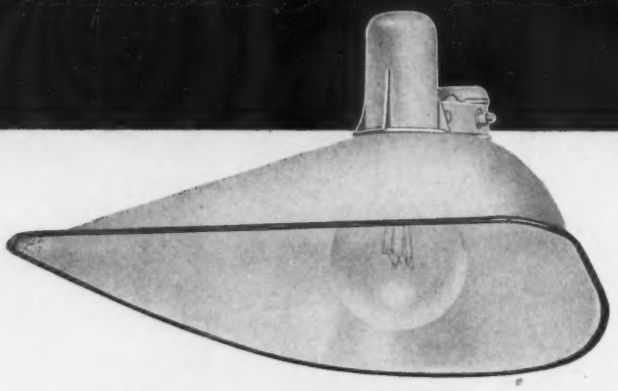
Headquarters for CONNECTORS

Burndy

Better, brighter illumination

WITH THE

"MASTER"



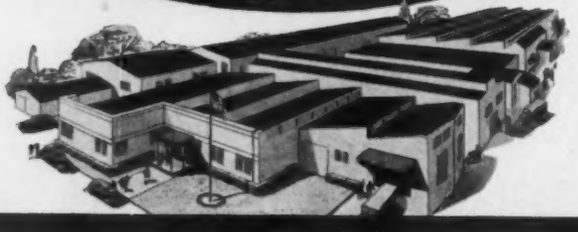
A highly efficient floodlight for use in service stations, parking lots, yards and other areas where maximum spread of light is desired. Finished in porcelain enamel, with neutral gray exterior. Supplied with mountings for wood cross-arms, 1" to 1½" pipe cross-arm or slip-over 1½" pipe mast. Takes 750/1000/1500 W. lamp.

SMOOT-HOLMAN COMPANY

SMOOT-HOLMAN

INGLEWOOD, CALIFORNIA

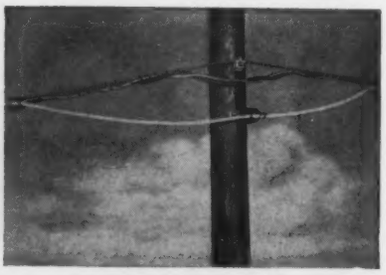
MADE IN U.S.A.



Offices in Principal Western Cities—Branch and Warehouse in San Francisco

Aerial Cable (225)

A self-supporting aerial cable, which it claims can be tapped hot by a regular member of the line crew, has been designed by the Okonite Co. Known as "Line-Tap" cable, this multi-conductor assembly utilizes the "Dualay" method of laying up conductors. In this construction, the conductors are twisted first in one direction and secured by the binder tape, then twisted in the other direction. This allows the conductors to be untwisted to provide slack cable so that the conductors may be separated for application



of wire guards and rubber blankets. Length between reversals, according to the announcement, is such that two sections may be removed at a pole by a man on the pole without a platform. It is stated that the cable can be opened up when installed, or later, without cutting a conductor or performing any operation on the messenger. It is available in standard sizes up to 10,000 volts.

Triode Tube (226)

General Electric has a new triode tube, type GL-9C24, for television and FM applications at the higher frequencies. This tube was designed particularly for use in a grounded-grid circuit as a class 3 radio-frequency amplifier and a class C radio-frequency amplifier and oscillator. Full ratings apply up to 220 megacycles. The tube has been tested under class B r-f power amplifier conditions with a band width of 5 megacycles, the manufacturer states. The anode is water cooled and capable of dissipating 5 kw.

Network Protector (227)

A new network protector for light duty has been developed by Westinghouse. One-half smaller and lighter than the previous light-duty protector, this unit is rated at 300 and 600 amp., 250 volts. It can be mounted on poles adjacent to existing transformers or, on new installations, as an integral part of the transformer itself. Simplifications in design were possible because of the relatively light demands made on it by the service intended, the manufacturer states.

Circuit Breakers (228)

Westinghouse announces that it has built 230-kv. circuit breakers capable of interrupting three and a half million kva. in three cycles and reclosing in 20. Operation of the breakers is by pneumatic mechanisms that reverse the contact movement during the opening stroke, for a reclosing operation.

Electronic Switch (229)

United Cinephone Corp. has announced a 30-amp. electronic switch designed for use in presence of explosive gases. The new model uses a relay with hermetically sealed contacts.

CHOOSE G-E WIRING DEVICES FOR ALL JOBS

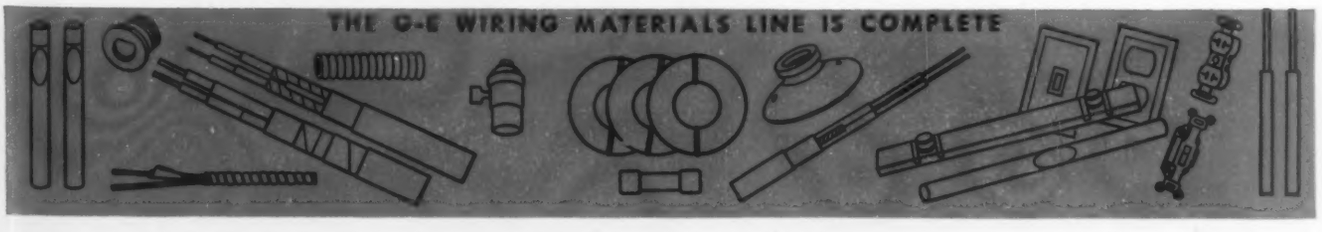
FEATURES

1. Easy to Wire
2. Carefully Engineered
3. Sturdy Construction
4. Well Insulated
5. Thoroughly Tested
6. Neat Appearance

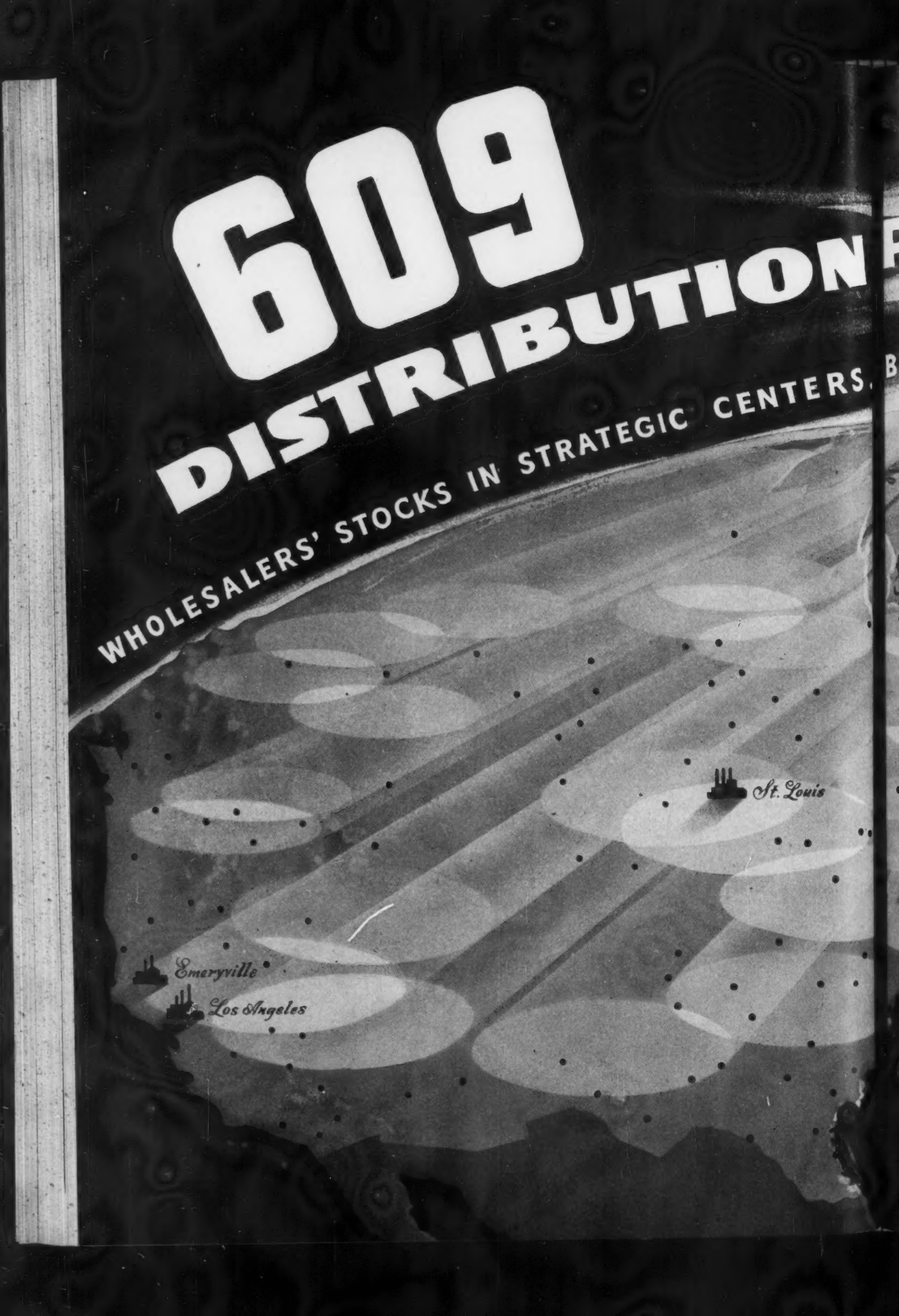
General Electric wiring devices are ideal for new wiring and for wiring modernization, wiring replacements and wiring extensions. They are high quality... attractive in appearance... will harmonize with any setting. They are easy to install, too, and will give long, dependable service.

Included in the G-E wiring device line is a wide selection of switches, convenience outlets, plates, lampholders, interchangeable devices, fluorescent accessories, plug and cartridge fuses, etc. The right devices are available for industrial wiring, commercial wiring and residential wiring. What's more they are available right in your own territory. G-E Distributors are located at key points all over the country.

For further information see the nearest G-E Merchandise Distributor or write to Section D261-18, Appliance and Merchandise Department, General Electric Co., Bridgeport, Conn.



GENERAL ELECTRIC


609
DISTRIBUTION
WHOLESALERS' STOCKS IN STRATEGIC CENTERS
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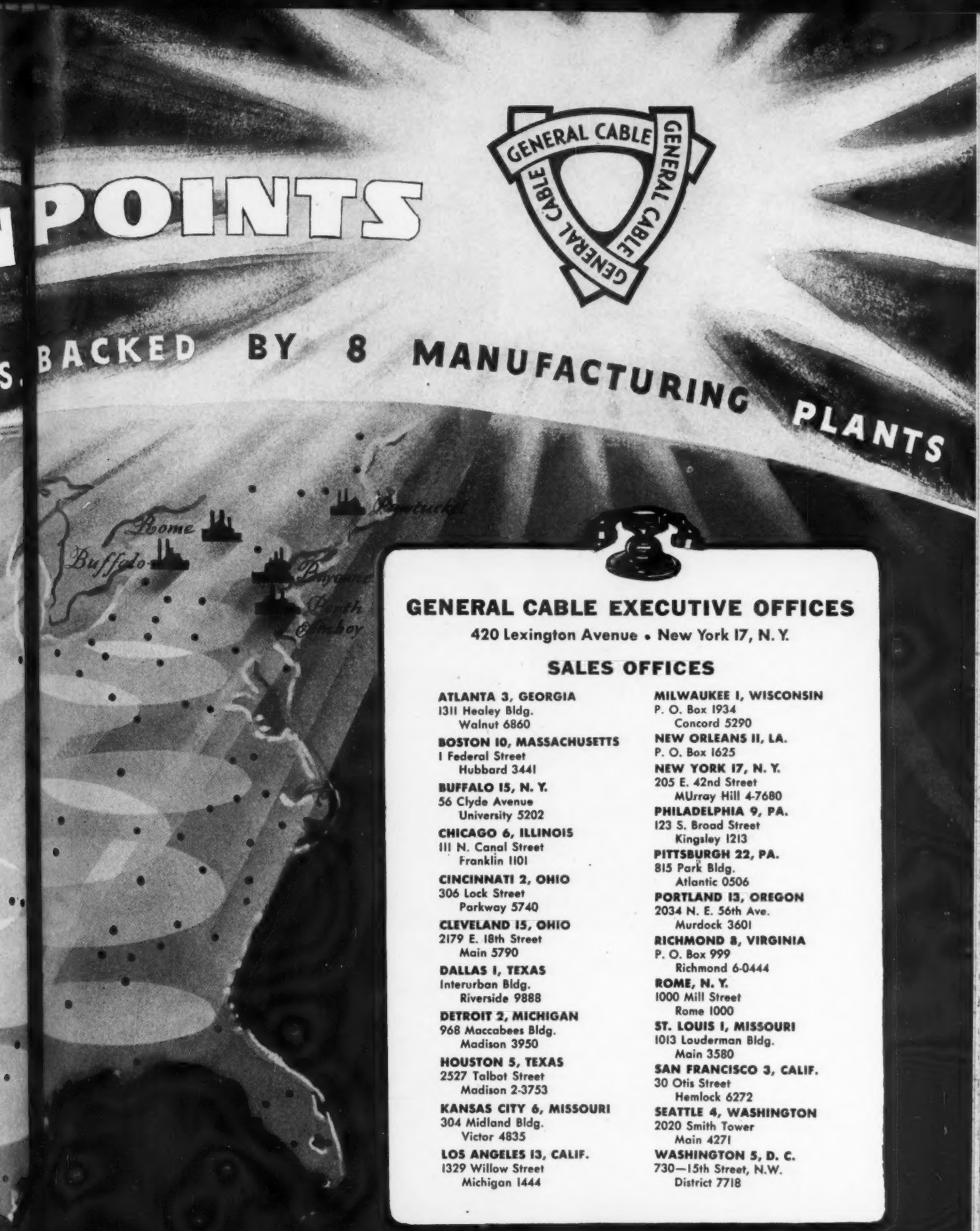
Emeryville
Los Angeles



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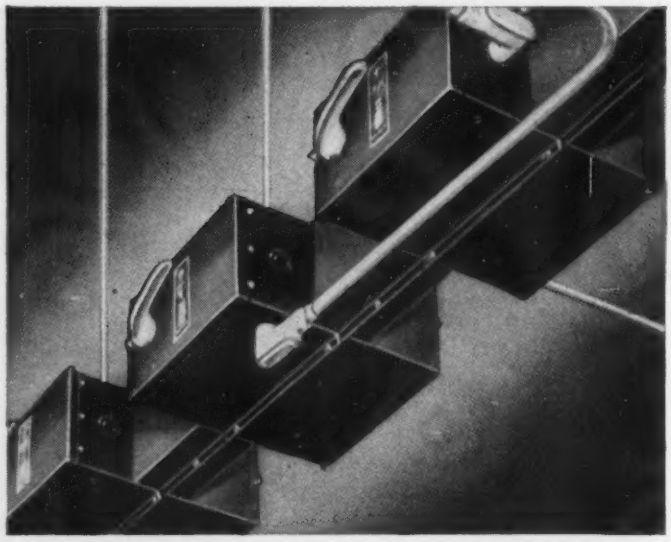
GENERAL CABLE
CORPORATION

THE BIG 3 OF ELECTRICAL DISTRIBUTION

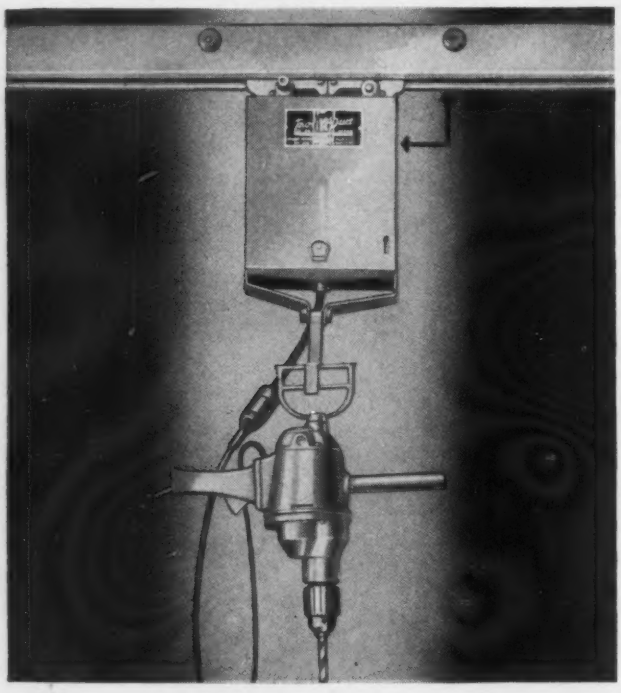
Meet the "Big 3" of electrical distribution: BullDog BUStribution DUCT, Industrial Trol-E-Duct and Universal Trol-E-Duct!

Recognized by industry as the most efficient systems of their type, these pioneers in the field of completely flexible and salvable electrical distribution systems are today saving countless hours on installation and maintenance — greatly reducing changeover time — helping to bring peacetime production to top speed and efficiency.

If you hope to successfully compete in the peacetime battle of costs ahead, it will pay you to investigate these superior BullDog Electrical Distribution Systems. Write now for complete details.



1 FOR PLUG-IN POWER, BullDog BUStribution DUCT which includes a variety of circuit protective tap-off Bus Plugs enables you to spot and plug-in plant machinery almost as readily as you plug-in your vacuum cleaner at home. No lost motion—no lost time! RATINGS: Plug-in Type up to 1350 Amps. Feeder Type up to 4000 Amps. 575 Volts or less.



2 FOR PORTABLE TOOLS, Cranes, Hoists or similar moving "loads" BullDog Industrial Trol-E-Duct supplies a source of safe, mobile power by means of Trolleys which, as they move through the elongated slot in duct, transmit current from the duct bus bars to the moving load. RATING: 90 Amps. 575 Volts or less.

3 FOR COMPLETELY FLEXIBLE LIGHTING, Universal Trol-E-Duct is a busway wiring system that can be tapped with Plugs or Trolleys at any point through the continuous slot in duct casing . . . Always keeps your lighting modern, for changes in type of fixture can be as readily made as changes in lighting positions. RATING: 50 Amps. 250 Volts or less.

BULLDOG

ELECTRIC PRODUCTS COMPANY

DETROIT 32, MICHIGAN.
In Canada:
BullDog Electric Products of
Canada, Ltd., Toronto.
Field Offices in All Principal Cities

Manufacturers of
Vacu-Break Safety Switches — SafToFuse Panelboards — Switchboards — Circuit Master Breakers — BUStribution Duct, for "plug-in" power — Industrial Trol-E-Duct for moving "loads."

CONSULT THE FOLLOWING PACIFIC COAST REPRESENTATIVES:

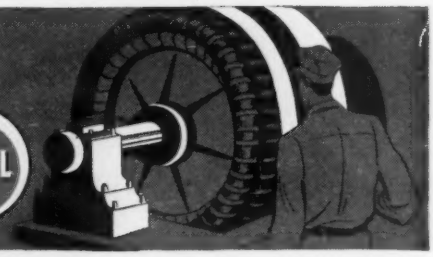
Coast Electric & Manufacturing Co.
1720 N.E. Sixth Avenue
Portland, Oregon, Tel. Garfield 2844

Safety Switchboard Company
1445 Stevenson St.
San Francisco, Calif., Tel. Hemlock 2470

Mullenbach Electrical Manufacturing Co.
2300 East 27th Street
Los Angeles, Calif., Tel. Jefferson 2224

STANDARD ENGINEERS NOTEBOOK

CALOL RPM

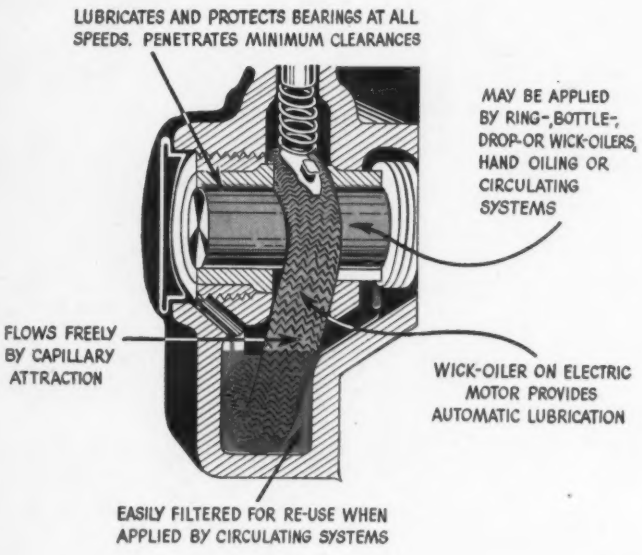


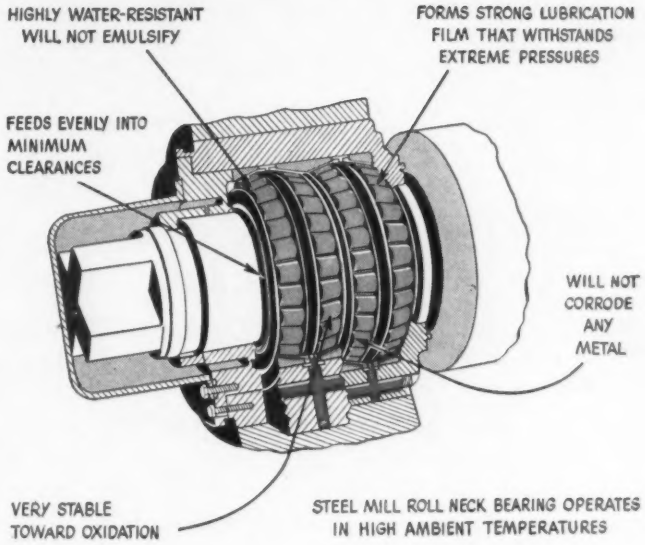
Pale engine oils reduce wear on plain bearings

Specially refined by the solvent process, Calol Engine Oils will meet all general lubrication conditions in mills and factories. They are straight mineral oils, pale in color and exceptionally stable in use. They have low pour points which assures a full flow of oil to bearings in cold weather.

Calol Engine Oils may be applied by all types of oilers and the heavier grades may be used in circulating systems in which oil is filtered and re-used.

There are three grades of Calol Engine Oils: 5, extremely light in body, is recommended for high-speed spindles and ring-oiled electric motors in sub-zero temperatures; 8 and 10 are recommended for bearings on steam engines, generators, motors and other high grade machinery lubricated by ring-, bottle-, drop-feed-, wick-feed oilers, or by hand.


LUBRICATES AND PROTECTS BEARINGS AT ALL SPEEDS. PENETRATES MINIMUM CLEARANCES
MAY BE APPLIED BY RING-, BOTTLE-, DROP-OR WICK-OILERS, HAND OILING OR CIRCULATING SYSTEMS
FLOWS FREELY BY CAPILLARY ATTRACTION
WICK-OILER ON ELECTRIC MOTOR PROVIDES AUTOMATIC LUBRICATION
EASILY FILTERED FOR RE-USE WHEN APPLIED BY CIRCULATING SYSTEMS


HIGHLY WATER-RESISTANT WILL NOT EMULSIFY
FORMS STRONG LUBRICATION FILM THAT WITHSTANDS EXTREME PRESSURES
FEEDS EVENLY INTO MINIMUM CLEARANCES
WILL NOT CORRODE ANY METAL
VERY STABLE TOWARD OXIDATION
STEEL MILL ROLL NECK BEARING OPERATES IN HIGH AMBIENT TEMPERATURES

Special grease carries heavy-duty loads

Wherever any type of heavy-duty, grease-lubricated ball or roller bearings are subjected to high temperatures, extreme pressures or moisture, Calol E. P. Roller Grease will solve the severe lubrication problems. Originally developed for steel mill operations, it is used with complete satisfaction in these mills on anti-friction roll neck bearings.

Calol E. P. Roller Grease is made from heavy bodied oil and special soap stocks wherein are incorporated extreme pressure additives. It is very cohesive and stable, lubricates satisfactorily in bearing operating temperatures up to 225° F. Its tough lubricant film withstands pressures far higher than other greases used on anti-friction bearings.

Fully moisture resistant, Calol E. P. Roller Grease resists oxidation, is non-corrosive to any bearing, and handles easily in grease pressure systems, even at low temperatures.

Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert help — make your maintenance job easier. Call your local Standard Representative or write Standard of California, 225 Bush St., San Francisco 20, California.

FOR EVERY JOB A **STANDARD OF CALIFORNIA** TEST-PROVED PRODUCT

Cole Electric Co.

1510 South Los Angeles Street
PRospect 2068
LOS ANGELES 15, CALIFORNIA

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POWER PLANT EQUIPMENT

AIR BREAK SWITCHES
MANUALLY OPERATED

AIR BREAK SWITCHES
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DISCONNECTING SWITCHES

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Pacific Coast Representatives

EICHER & BRATT
Colman Bldg., Seattle 4, Washington « « Eliot 2722

EARL S. CONDON COMPANY
357 S. Hill St., Los Angeles 13, Calif. « « MI. 2831

Hoist (230)

A. B. Chance Co. has developed a "Tips Tugger" hoist for tightening guy wires, hoisting transformers and a number of pulling, lifting and lowering operations. It will have a die cast aluminum body and handle to lighten weight; weighs 13 lb. and will lift a three-quarter-ton load with a 60 lb. pull on the ratchet lever. A trigger which can be operated by the finger changes the action from lift to lower. A turn button releases the brake so that the chain can be moved freely to attach to the load. This device has oil impregnated, porous bronze bushings in all rotating points and no lubrication is required, according to the manufacturer's announcement.

Infrared Units (231)

Carbomatic Corp. has announced new portable electric infrared units, model W-6 and R-12. The former has an aluminum reflector, 24 in. in diameter. The reflector may be raised or lowered and an adjustable arm permits an arc of 180°. The R-12 model takes 12 lamps and is equipped with three toggle switches, permitting operation of one, two or three rows of four lamps each. It is designed for up to three reflectors of 12 lamps each and is said to permit banks of tunnels of any design or shape. Standard reflector infrared lamps of either 125- or 250-watt size may be used in either model, the manufacturer states.

Door Actuator (232)

Electrical Engineering & Mfg. Co. is offering an automatic door actuator, designed for instant reversing. It is said to have built-in thermal protection against damage from overload when the door is accidentally blocked. Starting torque is 250 in. lb. Unit operates on 32, 64, or 110 volts d-c and can be modified to operate on 110 volts, single-phase a-c. It incorporates a magnetic clutch, thermal protection and three limit switches operated by adjustable cams.

F Lamp Diffusor (233)

Canfield Mfg. Co. is producing a fluorescent lamp diffusor, known as the Fluor-O-Shield. According to the manufacturer, this diffusor fits all open type fixtures and allows strip installations. It is installed and removed by means of snap-on clamps. Present models may be installed on any standard 40-watt (48 in.) and 20-watt (24 in.) fluorescent lamp. It is of lightweight aluminum and is finished in white baked enamel.

Plastic Preheater (234)

A 2.5-kw. dual preheater for plastics has been developed by the Airtronics Mfg. Co. The new unit, which measures 18x22x36 in., is in addition to the company's 5- and 10-kw. models. It is said to permit heating of two different loads alternately or in any sequence without adjustment between loads.

Cube Tap (235)

Eagle Electric Mfg. Co. has a streamlined bakelite cube tap, featuring reverse brass blades, improved pressure contacts, patented finding grooves for all outlets, invisible closing.

Important Features

- Simple in Design
- Easy to Install
- All Pieces Preformed
- Inexpensive
- Reinforces Conductor
- Increases Conductor Life
- Prevents Conductor from Chafing on Insulator
- No Complicated Tools Needed
- Holds Strongly Against Unbalanced Line Tension
- Meets Requirements of National Electrical Safety Code
- Assures Uniformly Good Results

NEW COMPLETELY PREFORMED INSULATOR TIE

Copperweld GRIP-FLEX 45

for use with Copperweld and Copperweld-Copper Conductors

Every lineman's reaction when he sees for the first time the Copperweld GRIP-FLEX 45 Insulator Tie is—"It's so simple. Why didn't I think of it?"

Yes—simplicity is one of the outstanding features of this distinct improvement over all hand wrapped ties. But it required years of engineering and testing before we could give you a tie so simple that every lineman can make a good tie the first time he applies it.

Careful prefabrication is the reason—all parts are precisely formed by machine to fit exactly and to give uniform results in tying.

You'll want to know more about this time and money saving tie. Complete literature sent on request.

Manufactured By

COPPERWELD STEEL COMPANY

GLASSPORT, PA.

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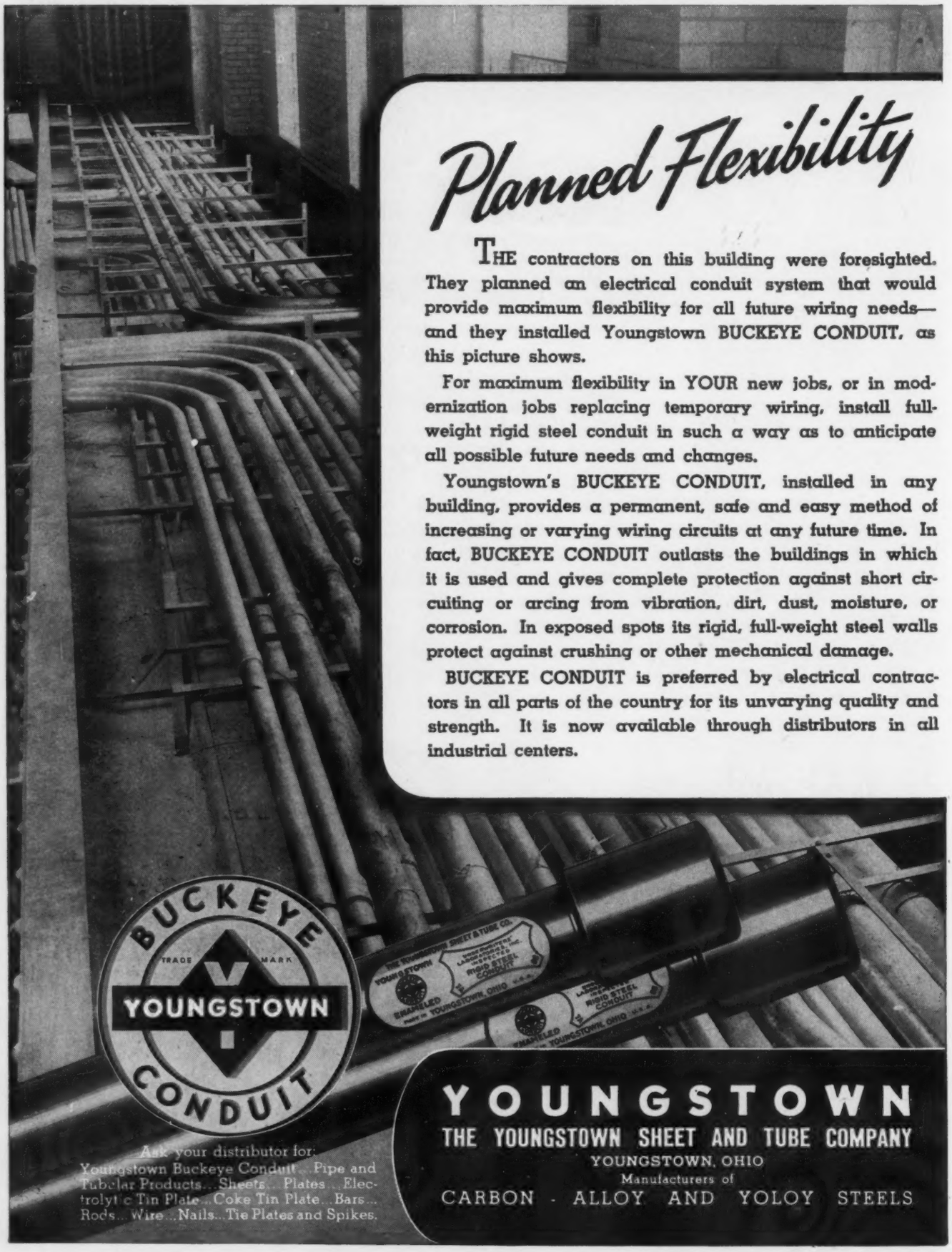
Pacific Coast Office: RIALTO BUILDING • SAN FRANCISCO, CALIFORNIA

FOR SAFETY'S SAKE . . . USE CONDUIT (*Full Weight Rigid Steel*)



Planned Flexibility

THE contractors on this building were foresighted. They planned an electrical conduit system that would provide maximum flexibility for all future wiring needs—and they installed Youngstown BUCKEYE CONDUIT, as this picture shows.

For maximum flexibility in YOUR new jobs, or in modernization jobs replacing temporary wiring, install full-weight rigid steel conduit in such a way as to anticipate all possible future needs and changes.

Youngstown's BUCKEYE CONDUIT, installed in any building, provides a permanent, safe and easy method of increasing or varying wiring circuits at any future time. In fact, BUCKEYE CONDUIT outlasts the buildings in which it is used and gives complete protection against short circuiting or arcing from vibration, dirt, dust, moisture, or corrosion. In exposed spots its rigid, full-weight steel walls protect against crushing or other mechanical damage.

BUCKEYE CONDUIT is preferred by electrical contractors in all parts of the country for its unvarying quality and strength. It is now available through distributors in all industrial centers.

BUCKEYE TRADE MARK YOUNGSTOWN CONDUIT

Ask your distributor for: Youngstown Buckeye Conduit . . Pipe and Tubular Products . . Sheets . . Plates . . Electrolytic Tin Plate . . Coke Tin Plate . . Bars . . Rods . . Wire . . Nails . . Tie Plates and Spikes.

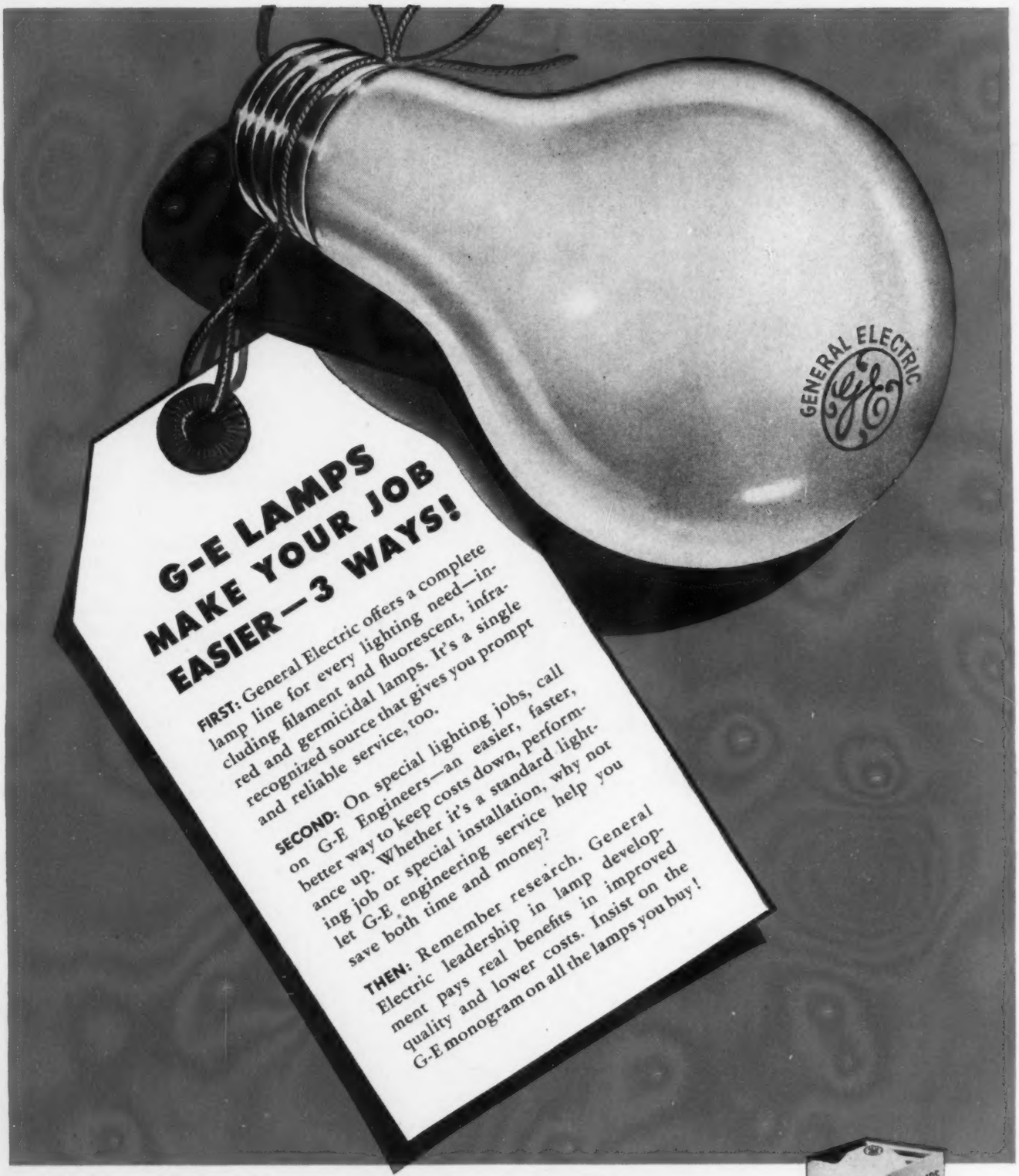
YOUNGSTOWN

THE YOUNGSTOWN SHEET AND TUBE COMPANY

YOUNGSTOWN, OHIO

Manufacturers of

CARBON - ALLOY AND YOLOY STEELS

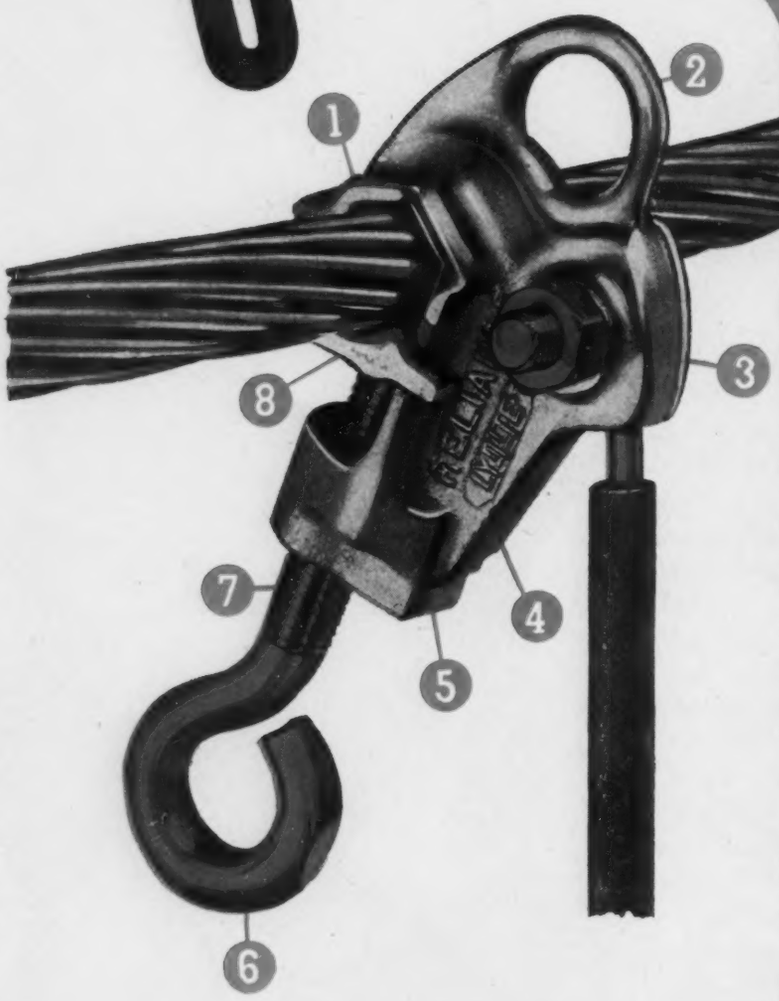

GENERAL ELECTRIC
G-E LAMPS MAKE YOUR JOB EASIER—3 WAYS!
FIRST: General Electric offers a complete lamp line for every lighting need—including filament and fluorescent, infrared and germicidal lamps. It's a single recognized source that gives you prompt and reliable service, too.
SECOND: On special lighting jobs, call on G-E Engineers—an easier, faster, better way to keep costs down, performance up. Whether it's a standard lighting job or special installation, why not let G-E engineering service help you save both time and money?
THEN: Remember research. General Electric leadership in lamp development pays real benefits in improved quality and lower costs. Insist on the G-E monogram on all the lamps you buy!

G-E LAMPS

GENERAL ELECTRIC

the Lamps that Bring 'em In . . . and Bring 'em Back !

8 IMPORTANT *Reasons* ••FOR USING THESE DEPENDABLE HOT LINE CLAMPS



1. Three point contact to line wire.
2. Ring for assistance in holding.
3. Bi-metal washer for aluminum to copper connection.
4. Heat treated aluminum casting insuring high strength.
5. Control lug, for engaging with socket of standard clamp-stick
6. Everdur eye screw.
7. Rolled thread screw.
8. Pressure bar connection to eye screw does not break off or jam.

SEND FOR NEW G-I PRICE SHEET DATED 9-45 Listing all sizes available

Reliable ELECTRIC COMPANY

3145 CARROLL AVENUE
CHICAGO 12

OVER 35 YEARS *Service* TO THE PUBLIC UTILITIES

Pedigree Varnishes

Distributed by

INSULATION MANUFACTURERS CORPORATION

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THE P. D. GEORGE COMPANY, ST. LOUIS, U. S. A.

TRUMBULL

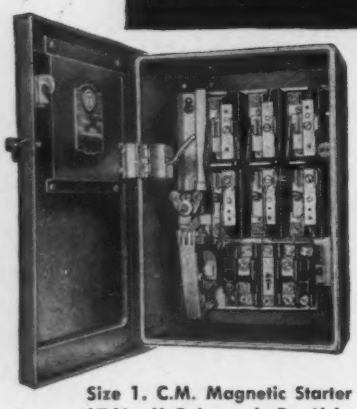
COMBINATION STARTERS

...for full Protection

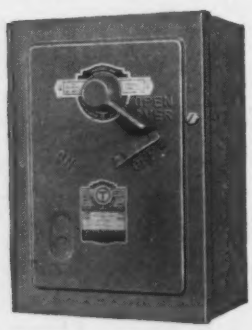
THE NATIONAL ELECTRICAL CODE

NO. 4409 IN SIGHT OF CONTROLLER

The disconnecting means shall be located within sight of the controller or arranged to be locked in the open position.



Size 1. C.M. Magnetic Starter (7½ H.P.) and Fusible Motor Circuit Disconnect.



Size 3. C.M. Magnetic Starter (50 H.P.) and Non-Fusible Motor Circuit Disconnect.

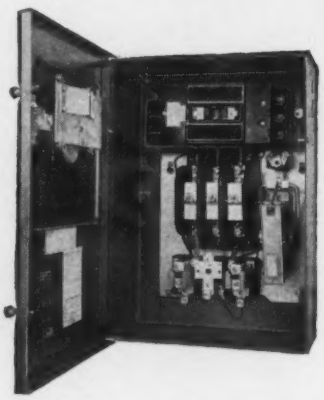
You're always Right

IF YOU USE

COMBINATIONS

To comply with Code requirements there's no better way than to combine both magnetic starter and motor circuit disconnect in a single cabinet . . . as illustrated by the three types of Trumbull Combination Starters here shown: Fusible, Non-Fusible and Circuit Breaker disconnect.

When starters are fed from individual circuit the No-fuse may be indicated; when short circuit protection at the starter is desirable, employ either Fusible or Circuit Breaker types. In any event, Combinations far surpass separate units in convenience, space saving and maintenance. They're completely wired to reduce mounting and wiring time.



Size 2. C.M. Magnetic Starter (25 H.P.) and Circuit Breaker Disconnect.

The Trumbull name plate on your starter indicates mechanical and electrical efficiency of the highest degree. It means that the "pioneer builder of enclosed switches" has included all the essential features required for long, safe operation and full protection against overload, undervoltage and danger due to phase failure. Sizes 0, 1, 2 and 3—2 to 50 H.P. in all capacities needed for normal machine operation. Remote or local control . . . push-buttons as desired.

Specify TRUMBULL COMBINATION MAGNETIC STARTERS...and be RIGHT

THE TRUMBULL ELECTRIC MANUFACTURING CO.

PLAINVILLE, CONNECTICUT

OTHER FACTORIES AT

NORWOOD, OHIO — LOS ANGELES — SAN FRANCISCO — SEATTLE

How RLM Standards Institute Helps BUYERS and SPECIFIERS

Measure Values

IN INDUSTRIAL LIGHTING EQUIPMENT

SPECIFICATIONS . . . . . The procedure for developing an RLM Standard Specification requires a thorough investigation and report by a Technical Committee of the Institute, guided by the findings of the Illuminating Engineering Society and other recognized industry associations. These specifications are available without charge to everyone interested.

INSPECTION . . . . . A rigid inspection and testing system, conducted by Electrical Testing Laboratories, Inc. a wholly independent testing organization . . . provides positive assurance that RLM certified Industrial Lighting Units conform to RLM rigid standards of efficiency and economy.

CERTIFICATION . . . . . When equipment so inspected and tested conforms to RLM specifications, the laboratory issues a label of compliance. When you find this RLM LABEL affixed to an industrial lighting unit you know that it has been manufactured in compliance with the exacting procedure developed and administered by RLM Standards Institute.

The RLM Standards Institute is a non-profit organization. Any manufacturer of Industrial lighting equipment may at his own initiative, if he so desires, submit his equipment for RLM inspection and certification. He need not become a member of the Institute. It is only necessary for him to assume his equitable share of the cost of operating the program.

The lettters RLM Stand for Reflector and Lighting Equipment Manufacturers

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Lenk's

TRUSTWORTHY PERFORMANCE

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SOLDERING IRONS
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Ask any user — check with any seller—they'll tell you LENK leads in sales and profits.

THE Lenk MFG. COMPANY
NEWTON LOWER FALLS 62, MASS.
Manufacturers of Soldering Equipment Since 1919

BULLETINS

data books, etc.

Load Interrupter Switches (236)

In bulletin 202-A, Schweitzer & Conrad describes its load interrupter switches, types SLB and RP-LB, gang-operated and cabinet-enclosed arrangements. Covered are indoor and outdoor types, ratings of 7.5 and 15 kv., with and without power fuses for short-circuit protection. According to the manufacturer, these load interrupters have been used for six years both in this country and abroad for load switching, insulating banks of transformers or feeders, disconnecting capacitor banks, etc.

Glass Seals (237)

A bulletin on Kovar, alloy for sealing to glass, has been published by Stupakoff Ceramic & Mfg. Co. It covers properties, lists standard shapes and sizes and gives techniques for making glass seals with Kovar. It is emphasized by Stupakoff that this bulletin has been prepared for manufacturing companies only and that special literature is available for those interested in purchasing assemblies.

Test Instruments (238)

Bulletins covering two types of insulation testers and other test instruments have been published by Weston Electrical Instrument Corp. Described are model 799, a low potential device designed for insulation testing where high test potentials cannot be tolerated, and model 796, which furnishes a test potential of 500 volts from internal batteries.

Air Switching (239)

Automatic Air Switching is discussed in a recent Railway & Industrial Engineering Co. bulletin. Divided into two parts, this bulletin has a section devoted to suggested applications and one covering available equipment. Illustrated by photos, charts and diagrams.

Transformers (240)

Sola constant-voltage transformers are described in an illustrated 33-page booklet recently issued by the company. This booklet contains engineering and operating data and lists 31 standard types in capacities from 15 to 10,000 va.

Silicon Products (241)

Properties of two silicon products, mold release fluid and compound, are given in a bulletin prepared by Dow Corning. These products are for rubber and plastic molding, plastic casting and pressure laminating.

Motor Controls (242)

Electron Equipment Corp. has a four-page bulletin on its electronic motor controls for industry. Illustrated.

Metals and Alloys (243)

Westinghouse has prepared a booklet covering its metals and alloys. Materials discussed are broken down by physical properties, chemical properties and applications. A comparison table is included.

Fuses (244)

G-E has a new 32-page catalogue of its cartridge and plug fuses, giving full specifications and other information. Operation of fuses, fuse history and fuse care are sections of general interest. Illustrated.

Insulators (245)

Victor Insulators Inc. tells the story of its operations in a 24-page booklet, recently off the press.

Incandescent Lamp (246)

The incandescent lamp is treated in the second of Westinghouse Corp.'s "Know How" lighting series. This booklet describes the lamp, tells the forms in which it is available and lists factors influencing good lighting.

Movies at Work (247)

A booklet listing reasons for adopting motion pictures as a management tool and suggesting means of using this tool has been published by the Bell & Howell Co. under the title, "Movies Go to Work."

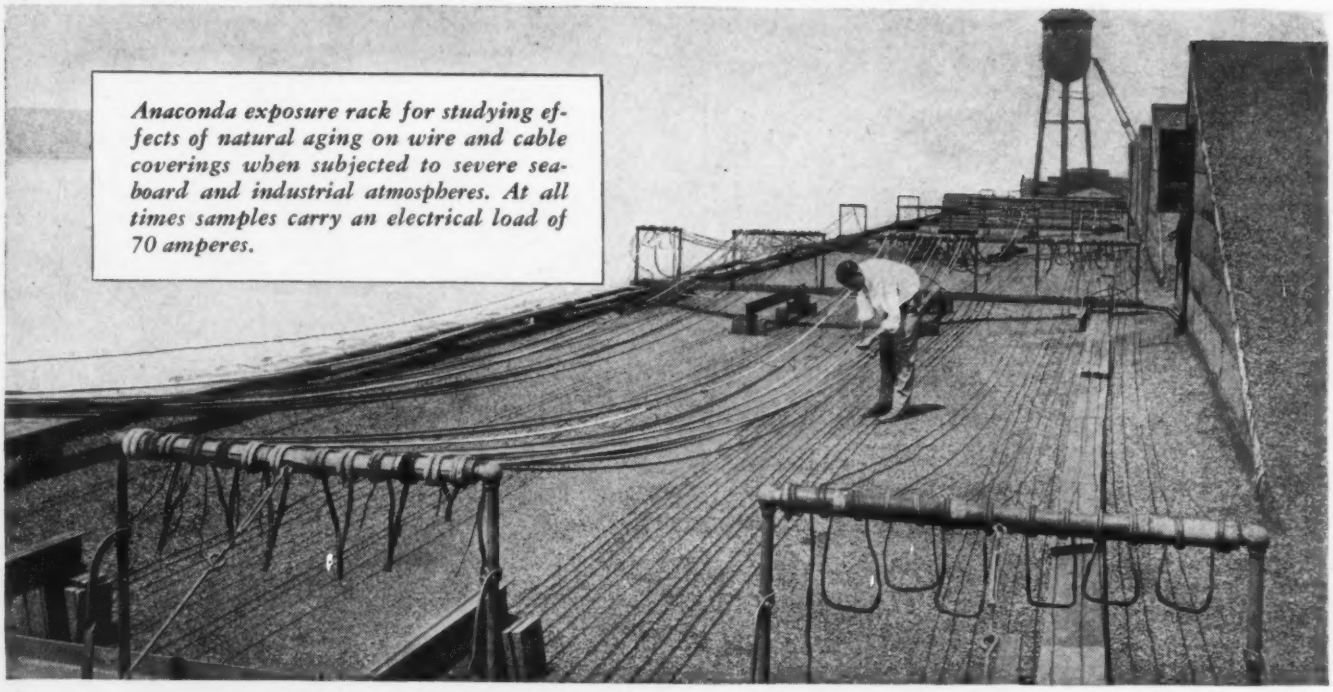
ELECTRICAL WEST, 68 Post St., San Francisco 4, California
Please send me information about following CIRCLED items:

200	201	202	203	204	205	206	207	208	209	210
211	212	213	214	215	216	217	218	219	220	221
222	223	224	225	226	227	228	229	230	231	232
233	234	235	236	237	238	239	240	241	242	243
244	245	246	247							

Name..... Company*..... Title*.....

Address.....

* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

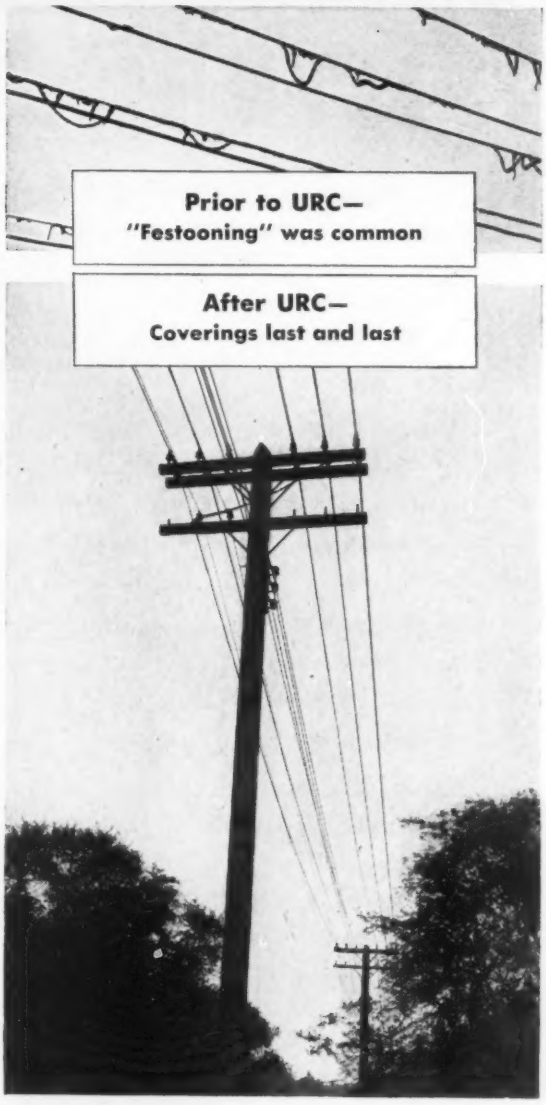


Anaconda exposure rack for studying effects of natural aging on wire and cable coverings when subjected to severe seaboard and industrial atmospheres. At all times samples carry an electrical load of 70 amperes.

Rigid tests prove URC Weatherproof lasts and lasts...

Besides the severe tests applied to the components of Anaconda Weatherproof, the finished wire and cable is subjected to long natural aging tests as shown in the accompanying pictures. These exposures are supplemented by laboratory accelerated aging tests. Both types indicate a trouble-free service capacity for years and years.

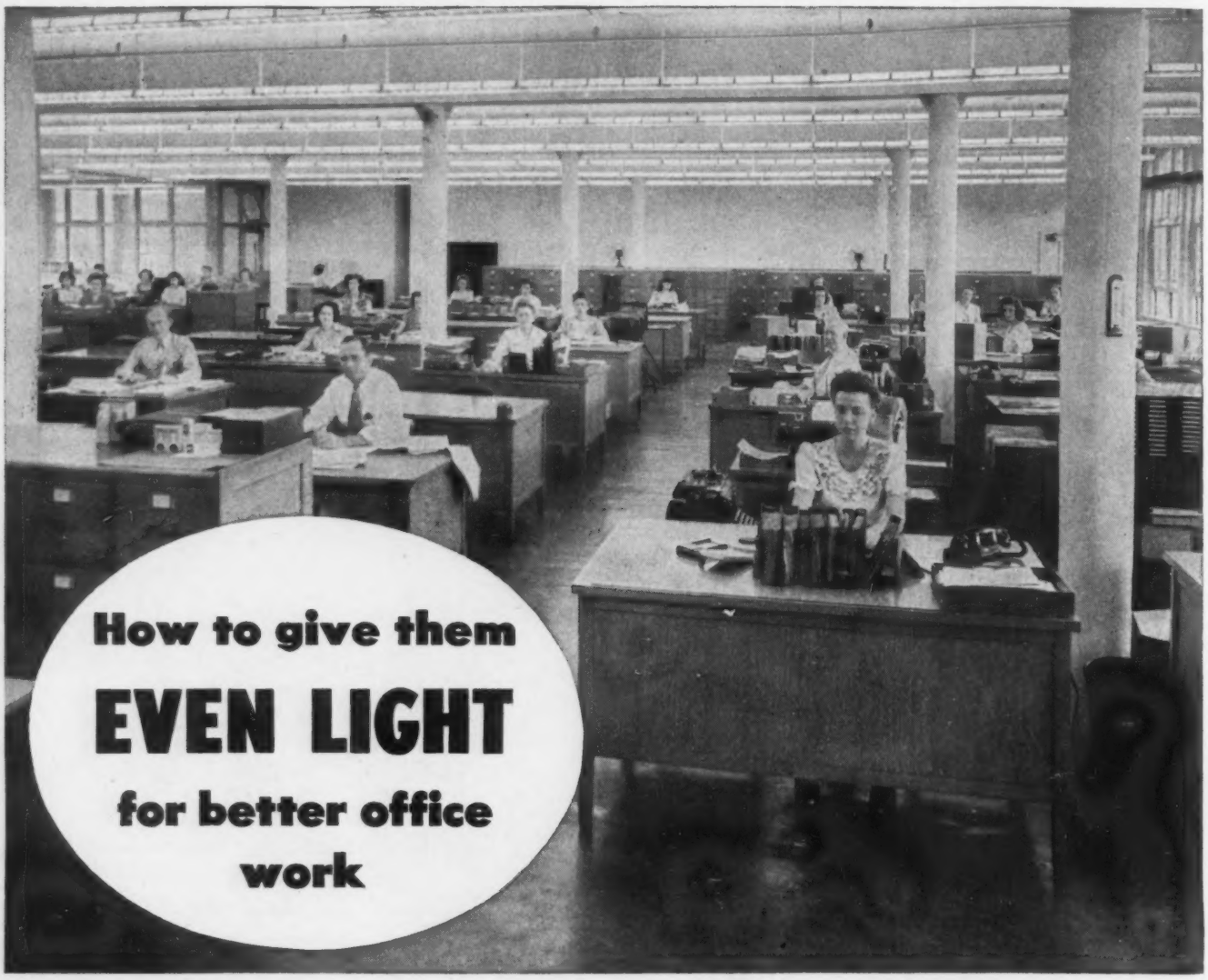
46294



ANACONDA
from mine to consumer

For Continuity of Service . . .
Anaconda Triple Braid or
Duraline URC

LOOK TO *Anaconda* FOR WEATHERPROOF THAT LASTS!



Wanted: Good lighting distribution throughout the clerical section of the Warner Chemical Company. Bothered by "spottiness" and low levels of light, they asked for help in improving lighting conditions.

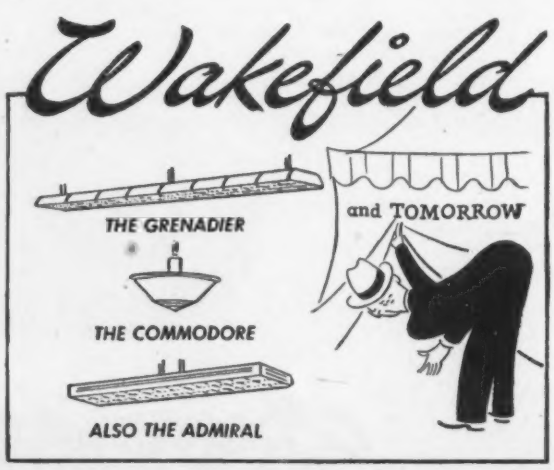
Problem: To secure as uniform distribution of light as possible with the use of present outlets. And also to help create a good-looking, modern office for greater efficiency.

Solution: Wakefield GRENADIERS No. PG2488 in continuous rows placed 7 feet apart did the trick. Their streamlined functional design puts plenty of light down on desks, and their translucent plastic sides provide light on walls and ceilings for greater eye comfort and better working conditions. The fact that GRENADIERS provide a wireway for feed wires made it easy to utilize present outlets with a minimum of change. Incidentally, the ease of hanging GRENADIERS greatly speeded the installation. Lighting level after 1000 hours operation: 35-40 footcandles.

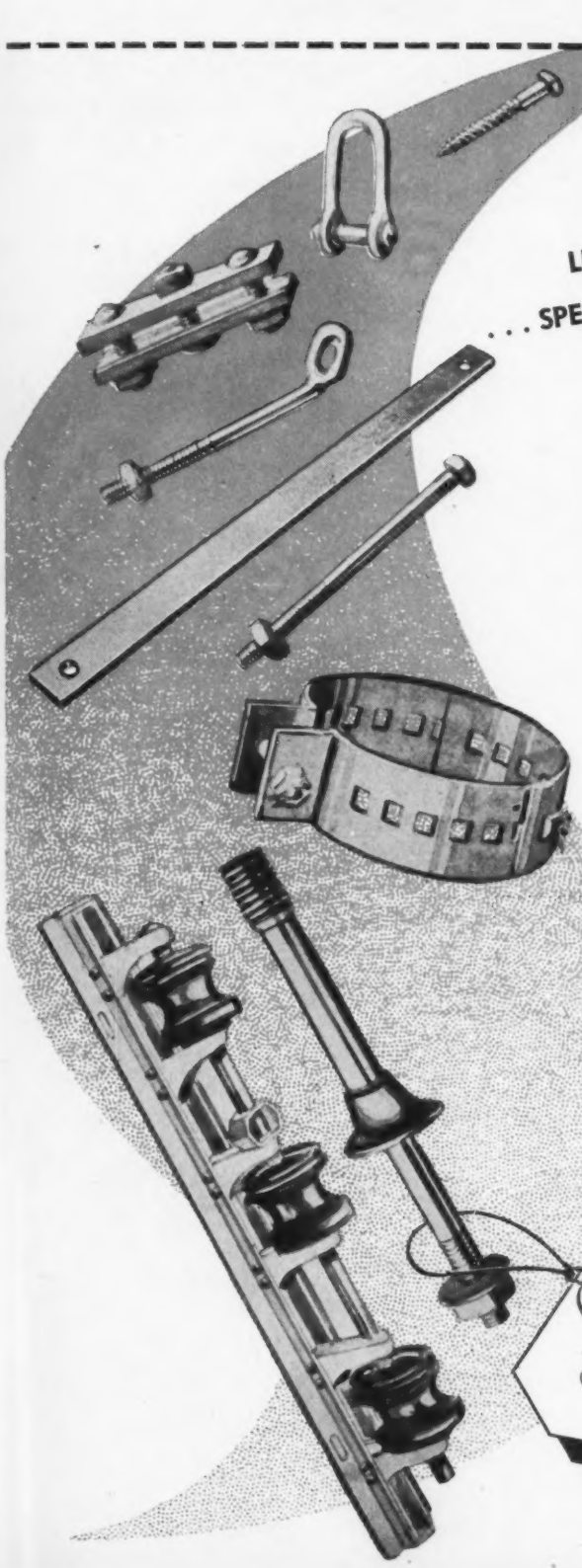
The lighting problems of your customers may be different, but you can be sure of this . . . Wakefield will be glad to work with you for the lighting results that you and your customers want. The F. W. Wakefield Brass Co., Vermilion, Ohio.

Are your customers throwing away DOLLARS?

Proper lighting maintenance — cleaning fixtures and walls and relamping — can double or triple their light. Urge them to get the lighting value they pay for. It's important to you!



Hardware



FOR YOUR TRANSMISSION AND DISTRIBUTION LINES GRAYBAR OFFERS FIRST-QUALITY SUPPLIES . . . SPECIALIZED SERVICE . . . FASTER DELIVERY

You're sure to get first-quality items when you order pole-line hardware from Graybar, because we distribute the popular Hubbard line. You're sure of getting the right items for your needs, because a Graybar Outside Construction Specialist can give you any help you may need in selection and application. You're sure of getting them as fast as possible, because—thanks to our national distribution facilities — "local delivery" is practically a synonym for "Graybar".

There are equally good reasons for selecting Graybar as your source of poles, crossarms, insulators, pins, and pole-line tools. Our nearest office is ready to put all these advantages to work for you. *Graybar Electric Company, Executive Offices: Graybar Building, New York 17, N. Y.* 4606

IN OVER 90 PRINCIPAL CITIES

Everything for your pole lines via GraybaR

Use G&W Type "RA" Oil Switches on pole-tops, too!

Type "ORA"
7500 volts
400 amperes
Full load break.

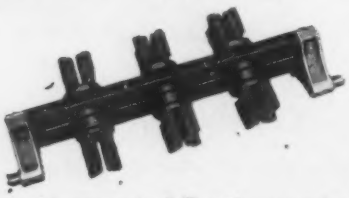
Get years of trouble-free service by installing metal-enclosed oil-filled disconnects for sectionalizing overhead circuits.

Oil immersed contacts and links are permanently protected against atmospheric corrosion and bad weather conditions.

It's easy to check whether the switch is "ON" or "OFF" by visual inspection through the large window.

Quick and safe operation from ground level.

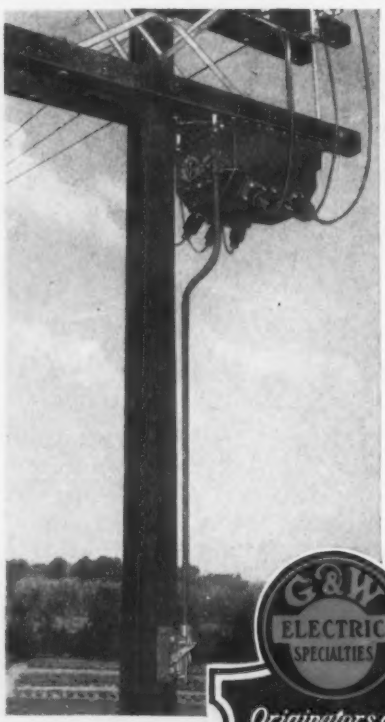
ROCKER ARM LINKS:



Floating contact links are encased in porcelain bushings which are in turn clamped in impregnated wood straps fitted with crank arms at the ends.

The shafts are in line with one set of floating contacts about which the rocker arm assembly pivots. One shaft extends through a Rotary Oil Seal to the external operating lever. The other shaft is set in a babbitted bearing on inside tank wall.

Positive oil-tightness is assured by the "Rotary Oil Shaft Seal" and by the individually tapered gasketed clamped porcelain bushings.



Using proper cableheads, welded tanks and standardized rocker arm assemblies, many forms of enclosed disconnects are regularly being made to meet a large variety of sectionalizing problems.

Write us or our nearest representative for further data.

G&W ELECTRIC SPECIALTY CO.

7780 DANTE AVE., CHICAGO 19, ILL., U. S. A.

Also made in Canada by Powerlite Devices, Ltd., Toronto

G&W ELECTRIC SPECIALTIES

Originators and pioneers of equipment for sound methods of underground and overhead electric distribution.

Potheads . . . Boxes . . . Oil Fuse Cutouts . . . Oil Switches . . . Multiple Circuit Disconnects

BLACKBURN *Hi-Strength* CONNECTORS

1st Choice OF EVERY DEPARTMENT!

ENGINEERING "We use BLACKBURN CONNECTORS because they're the only complete line of connectors made of DURONZE, which tests show is 75% stronger than hard copper or commercial bronze commonly used in other connectors. We've found that they're the strongest and most durable connectors made. And the reinforced pressure bar makes them still stronger."

DISTRIBUTION "BLACKBURN CONNECTORS are trouble-free on the line. They are stronger and don't distort when tightened up on the wire. That's why they can be used over and over again. The threads are smooth and free-running which produces a better pressure contact. All corners are rounded, so as not to nick wire or cut lineman's glove."

PURCHASING "We require, first, a dependable, quality product; second, good service; third, a fair price. We get all of these in BLACKBURN CONNECTORS. We've found that they are uniformly *high-quality, high-strength* connectors, which definitely cut our maintenance expense. Yet they cost no more than ordinary connectors."

Over 100 Conveniently-Located Jobbers' Stocks

JASPER BLACKBURN PRODUCTS CORP.

Main, Clinton & Madison Sts. • ST. LOUIS 6, MO.

Builders of Quality Connectors for Over 10 Years

NOW YOU CAN *"Go Underground"* WITH ROEBLING

PAPER INSULATED CABLES

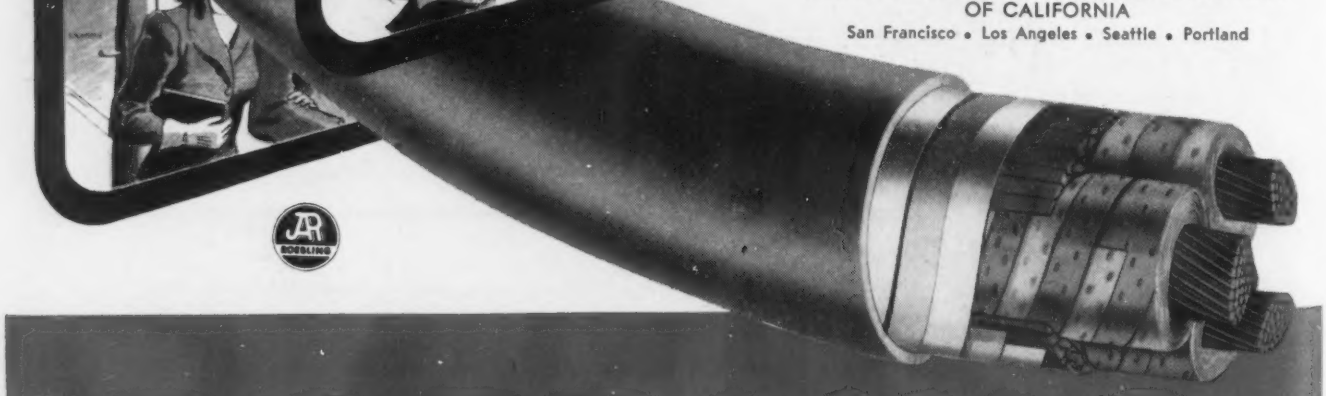
Probably high on your list of long-planned improvements in power distribution is the removal of overhead lines. Bringing them underground eliminates unsightly appearance, exposure to weather hazards. And *now* you can bring to the job the superior performance of Roebling Paper Insulated Cables.

Here is a "solid" Type Cable with high stress value that serves you well and economically in underground transmission or distribution circuits. Particularly preferred is the Shielded Type H, illustrated, adaptable for 3-phase grounded neutral circuits in the medium voltages. Usually drawn into conduits, it can also be installed directly into the earth with flat steel tape armor protecting the lead sheath.

But whether it's a standard Roebling power cable, or one designed to your own specifications, your requirements are met in stride by Roebling engineering, equipment, experience. Combined from first to last step of manufacture, they assure a finished product of safe, lasting serviceability.

We'll be happy to have a Roebling engineer go into the details of your cable modernization program with you.

JOHN A. ROEBLING'S SONS COMPANY
OF CALIFORNIA
San Francisco • Los Angeles • Seattle • Portland



ROEBLING

ELECTRICAL WIRES AND CABLES

Weatherproof Wire • Service Entrance Cables • Rubber-Covered Wires and Cables (Including Thin-Wall Insulated Building Wires and Cables) Rubber Sheathed Portable Cables • Rubber Insulated Power Cables • Magnet Wire • Telephone Wires • Pigtail and Braided Copper • Trolley Contact Wire • Bare Copper Strand • Varnished Cambric Power Cables.

A modern maintenance tool for utilities

G-E 2-WAY FM RADIO

"Watch-dogging" distribution systems to assure power continuity under year-round conditions of natural accidental hazards is a major responsibility. Tomorrow, expanded power systems bringing with them the ever-growing problems of exposure, will increase that responsibility.

For improving "round-the-clock" service even beyond present high standards and meeting emergencies throughout your circuit mileage, use G-E 2-way FM radio. It will provide the means for immediate dispatch of maintenance crews from one job to another. It will save valuable repair time. It will lower maintenance costs. Call your G-E sales engineer when you discuss your communication problems. He will have a competent specialist assist in planning the most effective system for your particular installation.

In serving your 2-way radio communication requirements, G.E. offers the same specialized attention and reliable service that is extended to you in your power distribution and maintenance requirements.

Write for these booklets: "G-E FM Communication System Guide" is a bulletin that gives practical every-day-language facts about the selection of 2-way FM radio and will assist you in estimating total installation costs. "G-E FM Communication Equipment Catalog" describes and illustrates the required units and accessories.

Electronics Department
General Electric Company
Syracuse, N. Y.

GENERAL ELECTRIC

163-E2-6016

Plan NOW to give your Community BETTER LIGHTING with HOLOPHANE REFRACTORS

SAFETY—with ECONOMY—for TOMORROW'S TRAFFIC . . . Across the nation progressive communities are now completing programs for new Traffic Safety Street Lighting . . . And Holophane Refractors play an important role in these plans because they offer outstanding advantages . . . They are designed to shape the light to the street—to place it in the right directions. More light where it is needed means greater visibility for each dollar expended. Holophane Refractors afford savings in maintenance costs too. Made of strong pressed glass they assure longer service life with the highest levels of efficiency . . .

For better illumination at lower costs specify Holophane Refractors.

WRITE TODAY for Booklet "Holophane Planned Lighting for Safe Streets". This is regarded by leading authorities as the "know-how" data on Street Lighting.

ARMY E NAVY

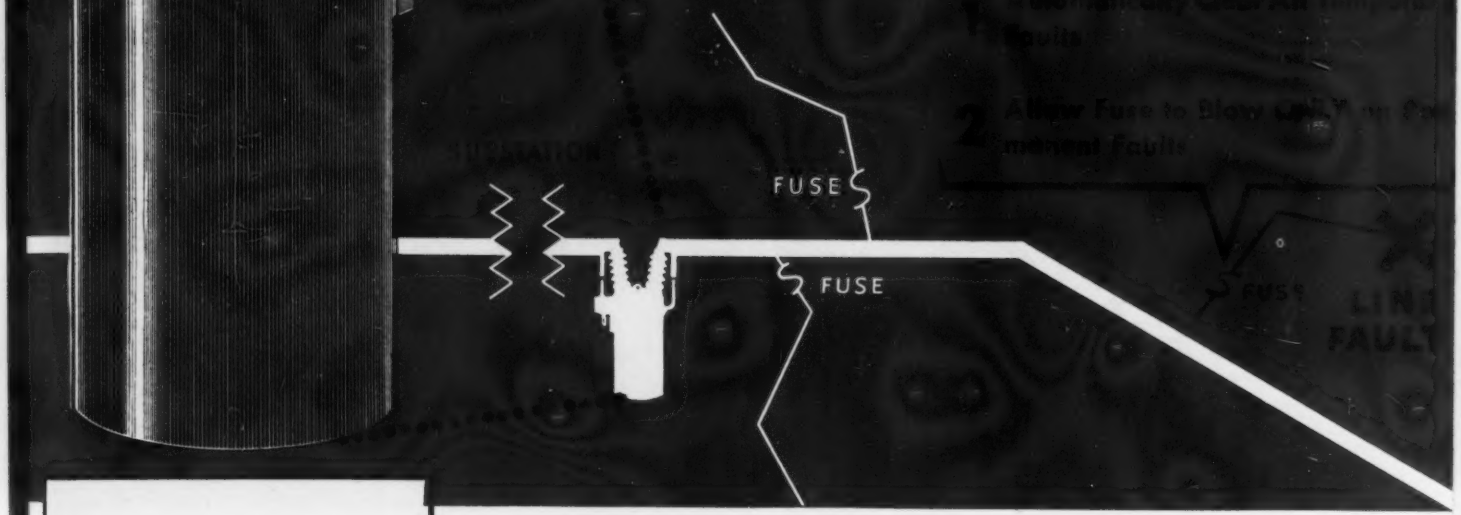
Holophane

HOLOPHANE COMPANY, INC.... *Lighting Authorities Since 1898*

342 MADISON AVENUE, NEW YORK 17 • Holophane Co., Ltd., 385 Yonge St., Toronto, Can.

Pacific Coast Representatives:—R. C. Dummel, San Francisco; F. van Gilluwe, Los Angeles
Distributors, General Electric Supply Corp.

Only KYLE CIRCUIT RECLOSERS PROTECT THIS SYSTEM TWO WAYS



KYLE FEATURES

Hydraulic Control Mechanism . . . Provides accurate timing on all Recloser Operations.

Double, Fast-Acting Contacts . . . Prevent burning of contact surfaces by high speed action.

Recloser is Triple Safe . . . Operating handle and tank always dead. No terminal in bottom of tank. Normal position of Recloser is open.

Recloser Ratings . . . Voltage: 2400 to 15,000; Ampere Rating: 5 to 50; Minimum Tripping Current: 10 to 100 Amperes; Interrupting Capacity: 150 to 1200 Amperes. Rating changed by replacing series trip coil.

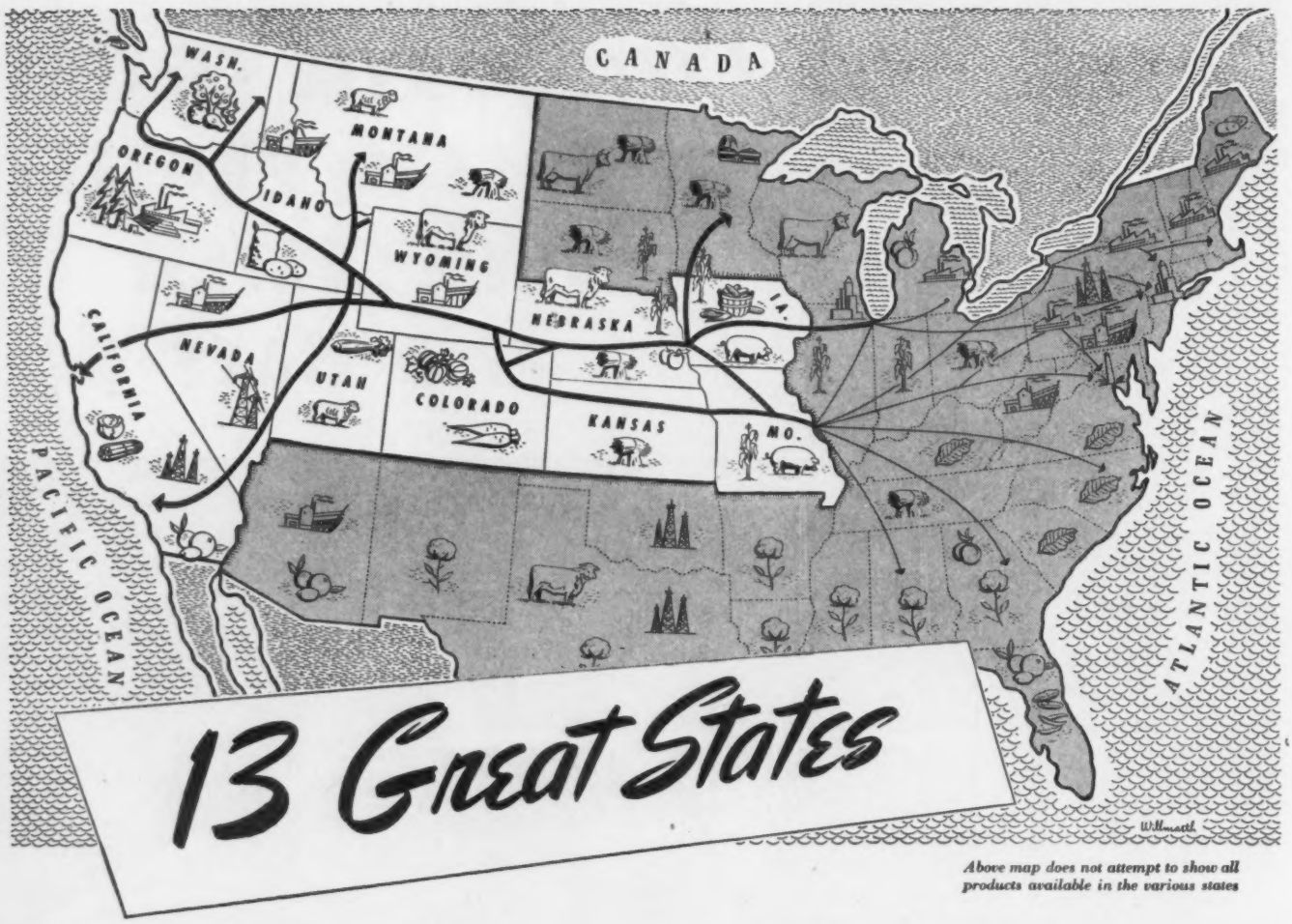
Kyle Type "H" Oil Circuit Reclosers are timed to provide fast opening on the first two operations . . . time-delay opening on the third and fourth operations. The two fast openings automatically clear all temporary line faults, such as those resulting from lightning or falling tree limbs, without damage to branch line fuses.

The time-delay openings of the Kyle Recloser permit the branch line fuse to blow ONLY on permanent faults . . . faults that cannot be cleared by the two fast openings. This isolates the affected branch line and maintains servic on the rest of the system.

After opening one, two, or even thre times, the Kyle Type "H" Recloser autc matically resets for another comple cycle of operations. A permanent fau on the main line will cause the Reclos to lock open after the fourth operatio This TWO-WAY automatic prote tion, which only Kyle Type "H" R closers can offer, results in better co tinuity of service, more satisfied cu tomers and reduced maintenance co

Your Line Material Representative can give you complete information on how you can provide your lines with this Kyle Two-Way Protection.

MADE BY KYLE CORPORATION SOUTH MILWAUKEE WISCONSIN



Above map does not attempt to show all products available in the various states

For more than 75 years, Union Pacific has served thirteen western states . . . been a partner in their development.

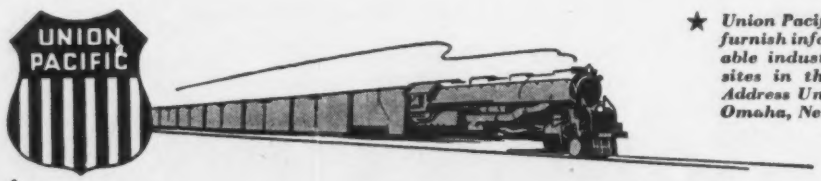
This vast fertile territory is more than the breadbasket of the nation. Due to its great wealth of industrial raw materials—ore, minerals, petroleum and lumber—it might also be called the nation's treasure-chest. Rivers have been harnessed—providing irrigation and power. And there is splendid rail transportation.

For example, in Colorado, Wyoming, Utah and other metal-mining states in Union Pacific territory, there is a large source of supply for the electrical appliances industry. Union Pacific has the equipment and personnel to meet all the requirements of shippers in those regions.

These thirteen western states served by the railroad are ripe for postwar expansion. They have the materials, facilities and space.

Union Pacific will continue to play its part in the future progress of this western territory by providing unexcelled freight and passenger transportation over its Strategic Middle Route.

Be Specific— say "Union Pacific"



★ *Union Pacific will, upon request, furnish information about available industrial and mercantile sites in the territory it serves. Address Union Pacific Railroad, Omaha, Nebraska.*

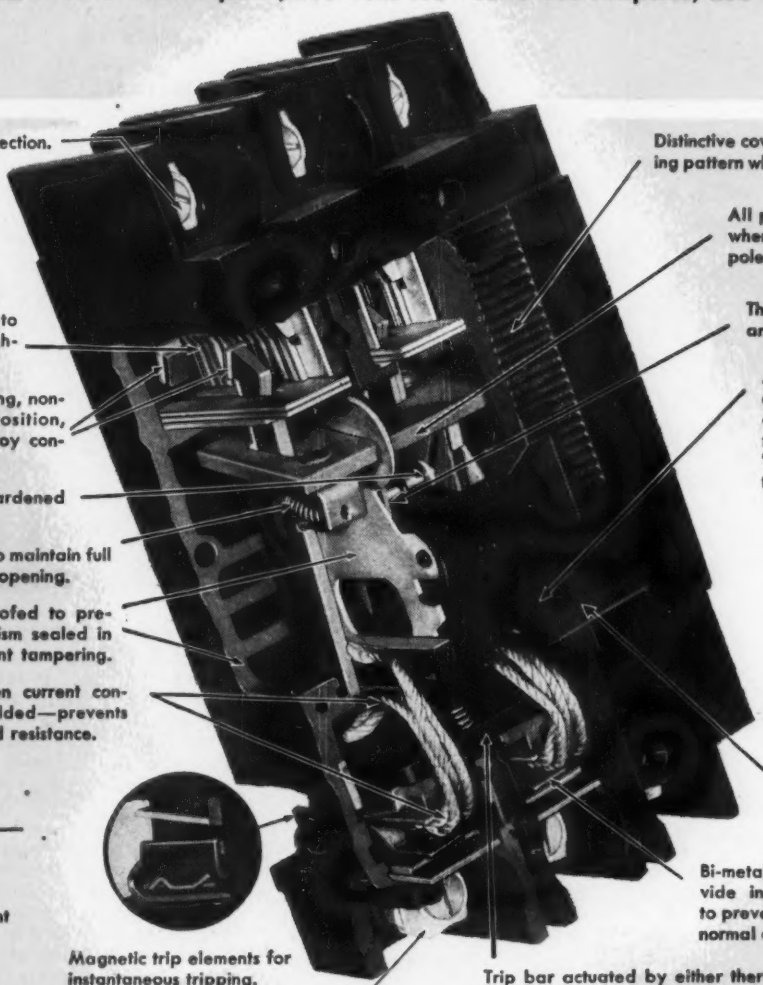
The Progressive

UNION PACIFIC RAILROAD

The Strategic Middle Route

A New and Improved
100-AMPERE FRAME CIRCUIT BREAKER

Type ML2 • 15 to 100 Amperes, 600 Volts AC—50 to 100 Amperes, 250 Volts AC-DC



Designed for front connection.

Distinctive cover design provides pleasing pattern when breakers are grouped.

All poles trip simultaneously when overload occurs on any pole.

Arc chambers designed to provide effective, high-speed interruption.

The mechanism is quick-make and quick-break.

Contacts are non-welding, non-oxidizing silver composition, mounted on copper alloy contact arm and terminal.

Automatic tripping is clearly indicated; handle assumes intermediate position between "ON" and "OFF" when breaker is tripped by overload.

Bearing surfaces are hardened to reduce wear.

Springs cause contacts to maintain full pressure until instant of opening.

All steel parts rust-proofed to prevent corrosion; mechanism sealed in bakelite case to prevent tampering.

All connections between current connecting parts are welded—prevents loosening and increased resistance.

Strong bakelite handle moves in sealed grooves.

Breaker Unit Dimensions

9 9/16" long
4 15/32" wide
3 3/4" high
4 7/8" maximum height including handle

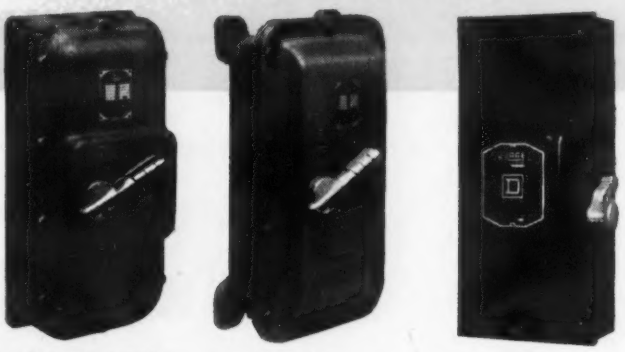
Bi-metal overcurrent elements provide inverse time characteristic to prevent tripping on momentary normal overloads.

Magnetic trip elements for instantaneous tripping.

Trip bar actuated by either thermal or magnetic trip elements. Mechanism always trip-free, so contact cannot be held closed against short circuits or abnormal overloads.

Solder-Solderless connectors furnished on ratings of 35 to 100 amperes. Screw and eared washer 15-20-25 amperes.

• The new ML2 is furnished in distribution panelboards, as well as the three types of enclosures shown at right. Write for ML2 Bulletin, which gives complete details.



Weather-Proof and Dust-Tight | Explosion Resisting | Dust Resisting

SQUARE D COMPANY

DETROIT • MILWAUKEE • LOS ANGELES

CONTROL AND QUALITY MEAN

NEW G. E. SUPPLY CORPORATION BUILDING recently opened at 300 NW Fourteenth St., Portland, Ore., is featured throughout by outstanding lighting. The picture above shows a night view of the excellent fluorescent troffer installation in the sales and office spaces. The twin rows of 40-watt fluorescent on seven foot centers are designed to provide 70 footcandles initially and are expected to maintain a "working" level of over 55 footcandles. Holophane controlescent lenses assure proper diffusion control. Lighting throughout the whole building is of comparable standards. At left is shown a daytime view of clerical office spaces. Included in the many other features of the new building are complete air conditioning of office spaces and showrooms and a germicidal lamp installation for office health protection. Drop in and visit us here or in any of our offices for detailed information on your lighting problems.

ASK —G. E. "WATCH-DOG" STARTERS that simplify fluorescent maintenance.
US —TEXTOLITE SOCKETS—ideal for new wiring, rewiring or maintenance wiring.
ABOUT —G. E. FUSES—for reliable overload and short circuit protection. The fuses G.E. uses to protect its circuits.

WESTERN REGION

GENERAL ELECTRIC

SUPPLY CORPORATION

SAN FRANCISCO—1201 Bryant St., MArket 4000
OAKLAND—9th & Jackson Sts., HIghgate 8330
LOS ANGELES—700 Turner St., MAdison 7141
FRESNO—1234 "O" St., FResno 4-4746
SAN DIEGO—205 W. Market St., MAin 6138
PORTLAND—300 N. W. 14th St., BRoadway 0651
SEATTLE—1212 First Ave. S., ELliott 4100
SPOKANE—So. 122 Monroe St., MAin 4288
SACRAMENTO—1131 "S" St., SAcramento 3-9001
PHOENIX—441 W. Madison St., PHoenix 3-3103

FOOTCANDLES THAT WORK!

Combine Miller Troffers and Holophane Controlens to Provide Lighting that Maintains High Footcandle Values During Service

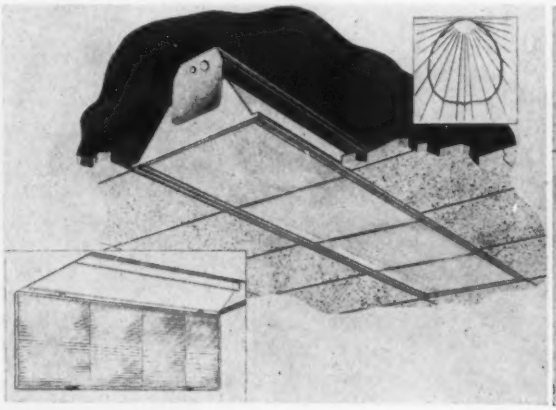
"Working" footcandles represent the actual amount of usable light provided. Common causes for lowering footcandle levels below designed levels include lack of maintenance that permits dirt and dust to collect on fixtures, variations in reflecting surfaces in the illuminated area and deterioration of lighting equipment. Here are three steps to follow to minimize these factors and to obtain the most "working" footcandles from your lighting installations:

1) Be sure the lighting is **carefully planned** to meet the conditions of the area to be illuminated—the right amount, the right type and the right control.

2) Be sure the equipment and the lamps are **built to stand up** in service—buy quality not price.

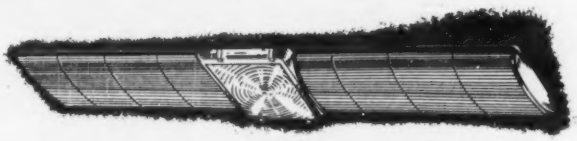
3) Be sure the equipment is designed for **easy maintenance.**

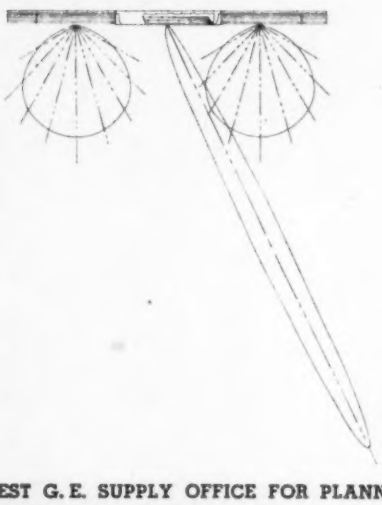
Miller and Holophane products are designed and built to provide real "working" efficiency in lighting installations.



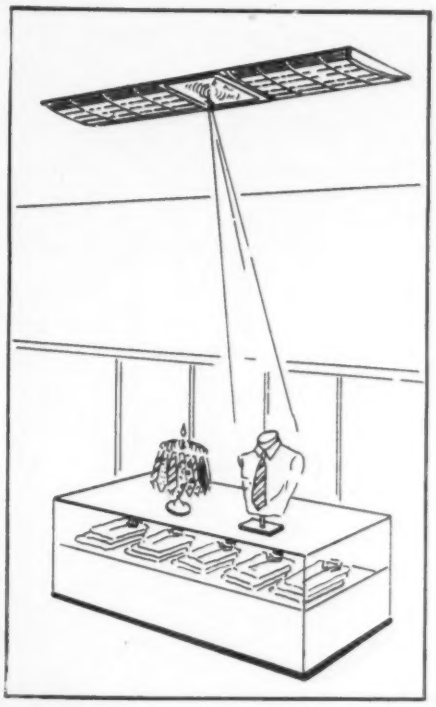
SIMPLIFIED MAINTENANCE is assured with the Miller hinged troffer unit shown at right. The door frame is a rigid welded assembly that permits ready removal of the lens panel for cleaning. Hinges are concealed, sturdy, easily operated and permit door to be removed without tools. Door cannot become accidentally detached. Latches are inconspicuous, positive, easily operated. They are sliding bolt type and self-locking in closed position. With this equipment it is simple to clean lenses, simple to clean reflector, simple to relamp. When maintenance is easy, "working" footcandles stay close to designed values.

CONTROL OF LIGHT is essential for visibility, comfort, economy. The new Holophane luminaire shown at the left helps retain the inherent efficiency of fluorescent lamps by scientifically controlling the light. This and other "Holoflux" controlescent units put the light down on the work area where it belongs. Their streamlined beautiful appearance will add the correct modern touch to interiors.





HERE IS A "HOLOFLUX" combination that includes an incandescent controlens unit to provide accent lighting. The sectional view at the right shows how general lighting from fluorescent lamps is combined with concentrated accent lighting from incandescent. The sketch at far right shows how this combination might be applied. The accent lighting is provided by inclusion of an optical train used with a 250-watt flood lamp which results in an intense narrow beam which may be offset vertically as much as 35 deg. and rotated laterally 360 deg.



CALL YOUR NEAREST G. E. SUPPLY OFFICE FOR PLANNING ASSISTANCE IN APPLYING THESE AND OTHER ITEMS TO YOUR LIGHTING PROBLEM.

ELECTRA'S HUSBAND

Letters to a Congressman

"I'M through standing in lines," Electra announced for no apparent reason the other night as she sat reading the evening paper. "You'll eat your bread without butter, I'll go without stockings and you can go to the office with ragged shirts or none at all. I'm through."

"What are you raving about?" I asked. "Did someone insult you while you were shopping today?"

"No, I'm just finished," she answered. "In fact I'm striking."

"Striking for what?" I asked.

"Striking against strikes," she replied. "Did you look at these headlines? Machinists' strike. Electrical strike. Butchers' strike. Maybe a steel strike. It makes me mad."

"What are you going to do?" I asked. "Get a bunch of women and picket somebody?"

"I would if it would do any good," she answered. "I don't know what to do. Have you got any answers, Mr. Smart Guy?"

"Sure," I said. "Write to your Congressman, for one thing. You ought to have done it a long time ago."

"Well why didn't you tell me about it?" she asked. "This is the first time you have given me any kind of a practical suggestion. The idea can't be original with you."

"It doesn't matter," I said. "Go ahead and write."

"Say, have you written yourself?" she inquired.

"No," I said somewhat sheepishly.

"Well then both of us will write," she said, getting up and going over to the desk. "Here's a paper and pen for you." And she handed me a fountain pen and a sheet of paper.

"How do you start?" she asked after she had settled herself at the desk.

"You'll have to write three letters," I said. "Start the first one 'My dear Senator.'"

Electra wrote and stopped and wrote and stopped. Occasionally she tapped her teeth with the end of her pen.

"How do you spell interminable?" she asked turning toward me.

"Just the way you pronounce it, i-n-t-e-r-m-i-n-a-b-l-e, I said. "What have you written?"

"You mind your business," she said. "I'm writing my own letter."

She finished before I did, for apparently my letter was longer. As a matter of fact I was working on my second sheet when she announced,

"Well, I've finished."

"I'll be through in a minute too," I said. "Then you can read me yours."

"Here it is," she began as I laid my letter down.

"My dear Senator: We have some pertinent questions to direct at you.

"Where are all of the new things for which we waited during the long war years. Just how much are strikes holding them back? Are we to have an interminable number of labor disputes? Have our lawmakers granted such powers to a few labor leaders that they can ignore the rights of the public? Has labor finally become more powerful than government in America?

"Is it not possible to amend existing laws or pass new ones which will curb these utterly wasteful labor disputes?

"We think that the time has arrived when someone should rise up and brand these strikes as 'Unfair to the American Public' and at the same time do something about them. This looks like a job for Congress.

"That's all," she said.

"That's plenty," I answered with just a touch of pride in my voice. "You do right well when something gets you aroused. It's a fine letter. Now copy it twice, only address the second copy, 'My dear Congressman.'"

"Would it do any good if I took the letters down to Red Cross and had some of the women sign them too?" she asked. "We were talking about the strikes today and some of them wanted to know what to do."

"Get a lot of them to sign them," I said. "It's the only way the Congressmen have of knowing how we feel."

"Aren't you going to read your letter?" she inquired.

"I've taken an entirely different approach than you did," I said. "But if you want to hear it, here goes:

"My dear Senator: I write to you as one of many business men who look with apprehension and misgiving at the rising tide of labor disturbances which are disastrously delaying the country's reconversion to a peacetime economy. Unless an early settlement of these disputes can be effected, and unless similar outbreaks can be prevented in the future, I see little hope for a sound business and industrial economy which can give the people higher and higher standards of living and at the same time carry the burden of war debt.

"It seems to me that there are simple legislative and judicial approaches to a solution. If Congress would enact legislation which recognized that for every vested or conferred right there is a corresponding responsibility, and that both rights and responsibilities should apply equally and fairly to all parties of these disputes, there could be little ground for disagreement. And if the courts, in interpreting such legislation, would find that there can be no privileges without reciprocal obligations, we would go a long way toward settlement of these disputes.

"One other step is important. It would be necessary for the responsible agencies of government to enforce the constitutional guarantees of security of person and property granted to all of us—individually and collectively.

"Is it asking too much of our elected representatives to effectuate such a program?

"That's all."

"Yours is a much better letter than mine," Electra said. "You get right to the root of the trouble—too many rights and not enough responsibility. You didn't think that up just now."

"No, I'll have to admit I've been working on it quite awhile. It's been a case of procrastination. I was going to write every day, just like a lot of other people. You ran me into a corner tonight and I had to do it."

"Do they pay any attention to these letters?" Electra asked. "I'll bet we won't get any answer."

"Don't wager any money on that, for you'll be agreeably surprised," I said. "A chap from Washington was telling some of us about how Congressmen react to mail from home. He said that he had actually seen the letters piled on two corners of a Senator's desk. The secretary puts all the letters favorable to a certain proposition in one pile and those opposed in the other. Then when the time comes to vote, the letters are counted and the Congressman votes accordingly. Of course there are times when the letter writing is rigged. But they can usually tell. Too many of the letters are exactly the same. Then they discount that particular support or opposition."

"I wonder which pile our letters will be on," Electra mused.

2

NEW NATIONAL ELECTRIC Surfaceduct

ALL PURPOSE Electrical Raceway

National adds to its system of surface raceways a most versatile product—Surfaceduct, a raceway approximately 2 x 2. Entirely accessible for ease of future wiring changes, it is adaptable to lighting circuits, power for work benches and heavy duty requirements up to 60 amperes.

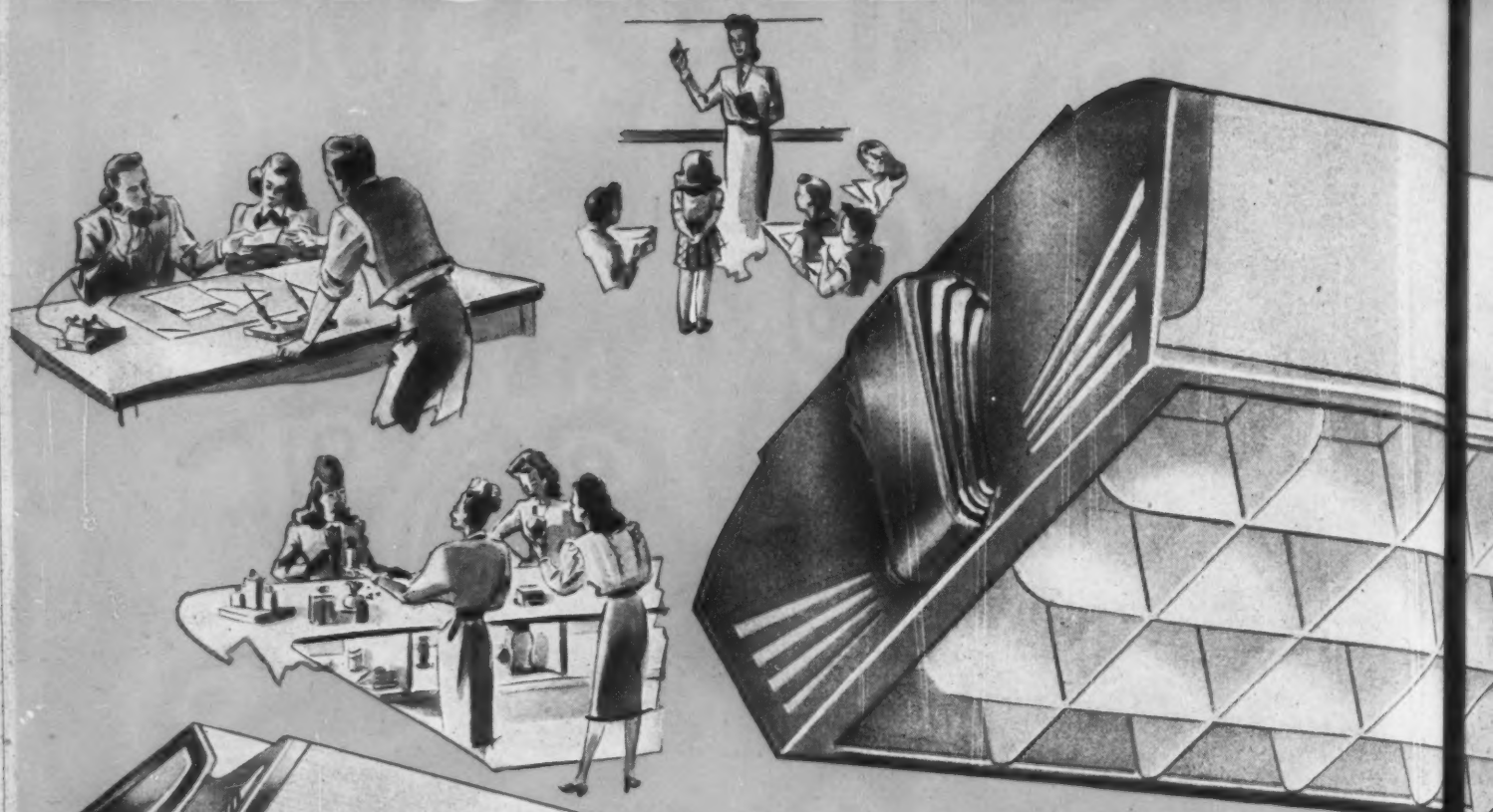
Surfaceduct has the "lay-in" feature, originated by National, which expedites wiring. An ingenious bridge insures firm anchorage of the capping or devices. Write for complete engineering data.

National Electric
PRODUCTS CORPORATION
Pittsburgh 22, Pa.

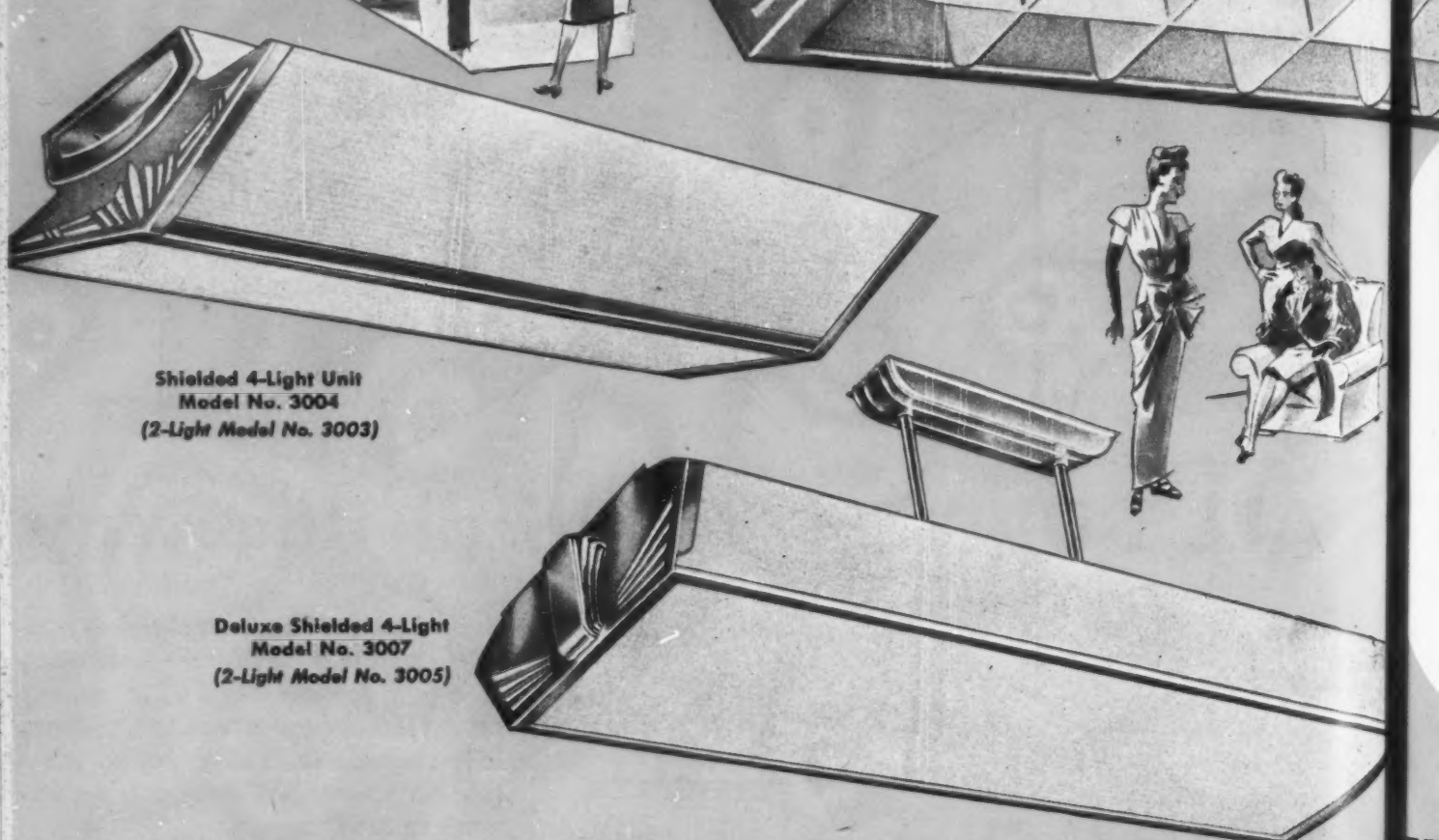
NATIONAL ELECTRIC PRODUCTS
WIRING SYSTEMS
WIRES AND CABLES

NOW . . . *Commercial*

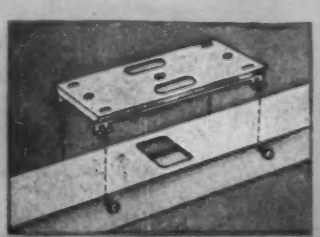
MITCHELL INTRODUCES



Shielded 4-Light Unit
Model No. 3004
(2-Light Model No. 3003)



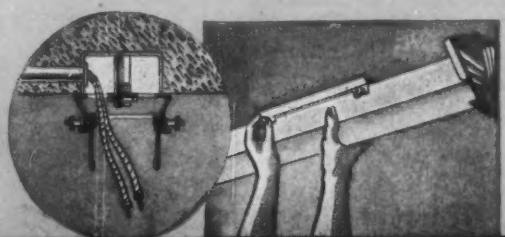
Deluxe Shielded 4-Light
Model No. 3007
(2-Light Model No. 3005)



ONE-MAN QUICK-MOUNT

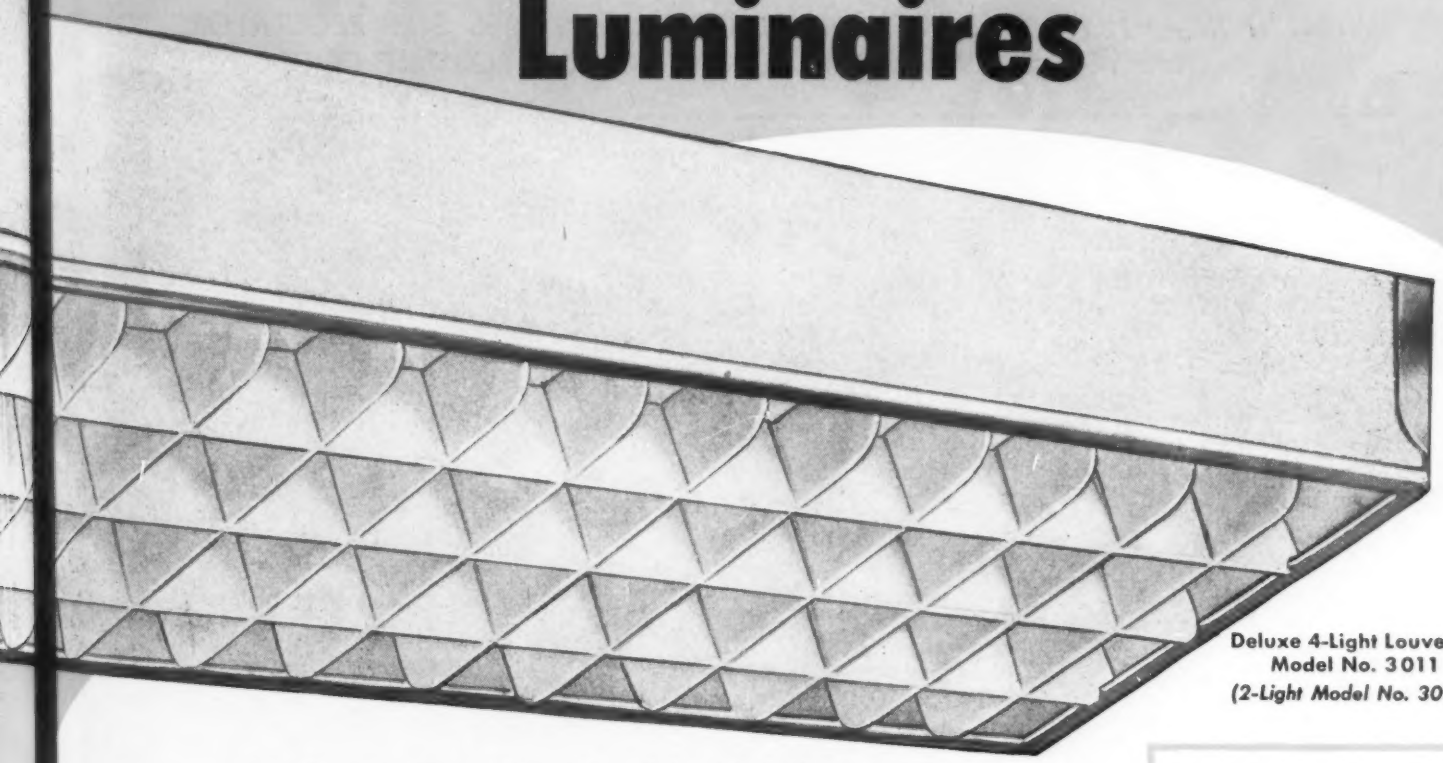
Permits one man to install a 2-light or 4-light fixture in less than half the normal time. Ceiling Plate is mounted to ceiling. Wireway Channel is raised to Ceiling Plate and securely fastened with 4 Captive Knurled Nuts.

Cross-Section shows house wires drawn through Ceiling Plate and Channel. Note open construction for convenient inspection. Wireway Channel secured into position for quick splicing of house wires to fixture wires.



Lighting Takes Another Step Forward!

NTIRELY NEW AND COMPLETE LINE OF Commercial Fluorescent Luminaires



Deluxe 4-Light Louvered
Model No. 3011
(2-Light Model No. 3009)

Setting a New Standard in Lighting Service!

Offering Exciting New Modern Designs in 2-Light and 4-Light Units . . . Glass-Shielded, Louvered and Open Types • Instant Start • New Patented "One-Man Quick-Mount"!

New opportunities for sales and profits . . . *greater than you've ever known* . . . are open to you now! For MITCHELL ingenuity brings you modern Luminaires to answer every demand for soft, glare-free lighting in stores, offices, schools, public buildings! In this new complete line, you get *a dozen and more vital advantages* that enable you to provide the *finest lighting performance on the market!* Installation is simpler than ever. Maintenance is made easier for servicing economy. Values are exceptional because each unit does a big job for the money.

Add to all this the great record and nation-wide acceptance achieved by MITCHELL products through the years . . . and you have the *strongest selling line today!* Build a big commercial lighting business. Get volume sales and volume profits. Sell MITCHELL Luminaires in 1946!

Get New Catalog No. 285

Use this powerful sales aid. Illustrates and describes complete line of Commercial Luminaires. Includes helpful lighting data, installation and servicing information! Write for it now!

ALL THESE FEATURES!

1. Higher Light Output—Less Glare
2. Scientific Shielding
3. Proper Lamp Spacing
4. True, Full-Depth Louvers
5. Luminous End Plates
6. Instant Start
7. Surface or Suspension Mounting
8. Quick, Easy Installation and Servicing
9. One-Man Quick-Mount
10. Fleur-o-Lier, U.L. and E.T.L. Approved
11. Single Carton Packing
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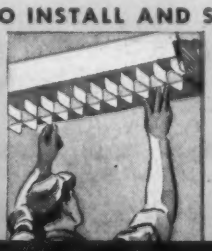
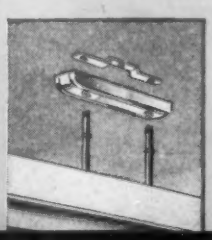
MITCHELL
FOR TOP LIGHTING VALUE

EASY TO INSTALL AND SERVICE

New, improved heavy-gauge steel wireway channels, with abundant knockouts for mounting and wiring. Wires, sockets, starters, glass panels, louvers, and other components are readily accessible for replacement, servicing,



Units may be surface mounted direct to ceiling, or suspended by Canopy and Stem Set (extra). Models illustrated above may easily be joined end-to-end in continuous rows.

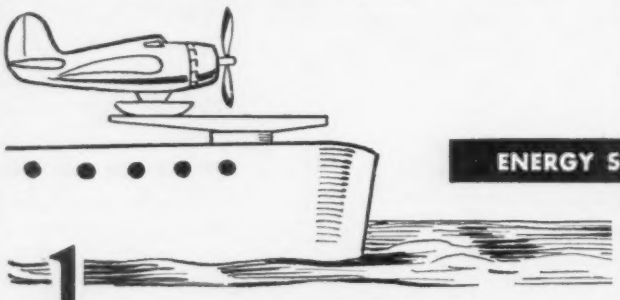


MAKERS OF

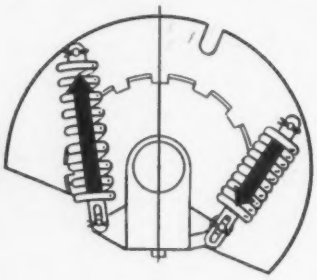
Commercial and Industrial Fluorescent Lighting Equipment • Store Window Lighting • Spotlights and Floodlights • Desk Lamps • Portable Floor and Table Lamps • Bed Lamps • Ultraviolet and Infrared Health Lamps • Residential Lighting Specialties

Meaning of The "Quick-Break" Principle

WHAT IT IS — HOW IT IS USED IN ALLIS-CHALMERS 5/8% STEP REGULATORS TO GIVE YOU CLOSER REGULATION AT LOWEST POSSIBLE COST

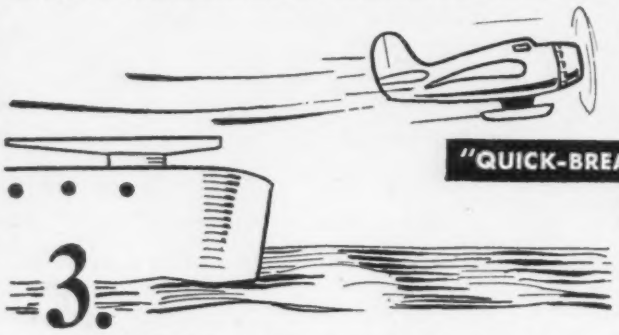


ENERGY STORED-UP

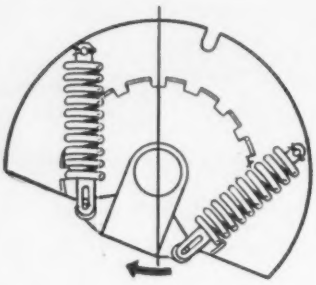


1. **A CATAPULT,** for launching seaplanes from the deck of a warship, illustrates the principle of storing up a reserve of mechanical energy for sudden — or "Quick-Break" — application.

2. **ALLIS-CHALMERS'** tap-changing mechanism illustrates the same principle. Here, energy is gradually stored up in a pair of *balanced* driving springs, preparatory to a "Quick-Break" tap change.



"QUICK-BREAK" RELEASE



3. **IN LAUNCHING** a plane, the catapult releases its stored-up energy all at once, shooting the plane out from the ship's deck. This is "Quick-Break" energy application, the opposite of slow-breaking application of energy as it is generated.

4. **IN THE A-C** tap-changing mechanism, quick release of built-up spring energy separates contacts with a *snap action,* in contrast to slow-breaking types of mechanism. Since the arc exists for only a *brief instant,* arcing doesn't burn or pit contacts.

QUICK-BREAK" PRINCIPLE MEANS LOW MAINTENANCE, EXCEPTIONALLY LONG CONTACT LIFE

WITH ARCING reduced to a minimum by "Quick-Break" contact separation, contacts on Allis-Chalmers 5/8% Step Regulators may be expected to last as long as the regulator is in use. As a matter of record, no current-carrying contact has ever been replaced on an Allis-Chalmers 5/8% Step Regulator, due to deterioration in normal service.

OTHER LOW MAINTENANCE PRINCIPLES: 1) Unit construction of A-C 5/8% Step Regulators, eliminates 78 bolted connections; 2) Oil immersion of all moving parts keeps parts dust-free, eliminates need for lubrication; 3) Feather-Touch control, with voltage integration, eliminates holding coils, sealing-in switches.

Get the full story on economical 5/8% Step Regulators for all voltages by writing for Bulletins B6056A and B6065, ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN.

A 1934

ELECTRICAL WEST

VOL. 96 NO. 2
FEBRUARY 1946

NEW HORIZONS AHEAD

BUSINESS and industry throughout the Far West is straining to keep its performance and planning ahead of the optimism of the people of this region. Everyone foresees great times ahead for this expanding industrial frontier. A predicted recession has not materialized, even though there have been some severe reconversion pains. War-swollen populations are being retained; furthermore, newcomers from the East and Middle West, coupled with released military personnel who would make this region their home, are adding to an already critical housing situation and are overstraining the service facilities. Even so (and despite unemployment figures) skilled and unskilled labor pools are not fulfilling the requirements of employers.

Along with all other service industries, the electrical business now is cutting and fitting its war-created surpluses, extra-curicular skills, and overstrained facilities to the future of this region. War pressure vastly increased the West's industrial, agricultural and commercial stature. War gave the West factories and facilities, raw materials, power supplies, population, a labor pool and management know-how that otherwise might have required two decades to obtain. While the resultant changes have been deep and basic, they simply tend to emphasize a trend which has been developing over a long period of time. One expert defines it thus: "The pattern of the trend is this: great events have periodically jolted a pronounced incline into a steep upthrust; occasional setbacks have been soon overcome; most of the gains of epochal periods have been retained, each era establishing the region on a permanently higher economic level."

Comparative figures (1940 and 1944) on various aspects of the West's economy, indicative of the war's effect, are shown in the tabulation on the following page, along with noteworthy figures of electrical progress. Statistically the eleven Far Western states account for 40% of the area of the U. S., 43% of the lumber production, 21% of the mineral production, 17% of the motor vehicle registrations, 13% of the retail sales and 15% of the national income. Electrical statistics reveal equally relevant comparative facts: The region contains 17% of the total U. S. electric generating capacity; it produces 19% of all the electric energy used; it is the major producer of hydroelectric energy, 47%. Population of the area (up 2¼ million during the war) 11.8% of U. S. total.

Electrically here are some of the things the first year of peace potends: (1) A developing housing boom which will assure long-time markets for electrical supplies and appliances. (2) Pent-up demand and power company sales programs which insure ready sale for whatever appliance stocks that will be available. (3) The second largest power company construction budgets in the history of the industry. (4) New industries as well as expansions of existing plants that promise large electrical markets. (5) A huge backlog of industrial, commercial and residential modernization in which material and labor supplies will determine the ultimate volume of business. There is no denying that new horizons and new opportunities—many of them war-created—lie ahead of the electrical industry.

Table I—Comparison of National to Western Operations for 1944 and 1945

	11 Western States		United States		Per Cent West to U.S.	
	1944	1945	1944	1945	1944	1945
Energy generated (Millions of Kwh.)†	43,945	42,101	227,427	223,870	19.3	18.9
Energy generated in Hydro Plants (Millions of Kwh.)†	37,156	37,360	73,752	79,518	50.3	47.0
Energy generated in Fuel Plants (Millions of Kwh.)†	6,789	4,741	153,675	144,352	4.4	3.3
Percentage of Hydro to Total Generated	84.5	87.6	32.4	35.5	..	..
Installed Generaton Capacity (Kw.)†	8,776,104	8,739,116	50,244,703	49,901,280	17.5	17.5
Installed Hydro Generator Capacity (Kw.)†	6,318,092	6,317,019	14,579,970	14,884,098	43.2	42.4
Installed Fuel Generator Capacity (Kw.)†	2,457,912	2,422,107	35,664,733	35,017,182	6.9	6.9
Revenue from Energy Sales (Thousands of Dollars)‡	435,000	437,500	3,276,752	3,334,000	13.2	13.1

† Source—Federal Power Commission. ‡ Data from EEI. 1945 estimated.

Table II—Ten-Year Generation Record for Western Public Utilities

(Thousands of Kilowatt-hours)

	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945*
Arizona	377,797	510,483	717,825	696,787	1,327,485	1,404,299	1,459,689	2,630,936	3,198,771	3,747,273	3,474,575
California	9,060,296	10,091,716	9,632,178	9,426,519	9,403,588	9,788,869	10,383,352	11,583,154	14,776,371	15,958,664	15,922,000
Colorado	549,157	652,404	721,482	731,395	760,445	791,967	818,213	977,690	1,097,260	1,083,666	1,131,122
Idaho	672,466	796,430	972,212	992,278	1,126,518	1,175,305	1,142,341	1,244,946	1,338,183	1,256,541	1,234,018
Montana	1,296,199	1,452,390	1,319,637	1,324,151	1,575,016	1,769,124	2,177,623	2,248,133	2,597,086	2,477,463	2,325,515
Nevada	27,719	171,499	1,152,788	1,491,205	1,855,042	2,324,176	2,403,747	2,432,124	3,228,132	3,329,478	2,608,909
New Mexico	190,744	214,602	255,378	262,124	281,508	316,862	368,449	409,854	470,931	507,489	554,637
Oregon	1,083,818	1,250,421	1,392,177	1,253,615	1,484,468	1,739,903	2,909,772	3,651,159	4,619,280	4,831,000	4,221,798
Utah	309,835	418,194	507,415	340,172	425,474	577,641	564,812	604,393	619,280	460,112	417,760
Washington	2,981,621	3,273,148	3,734,715	3,400,683	3,642,610	3,944,184	4,499,031	6,494,920	8,926,679	10,343,262	9,995,406
Wyoming	93,779	114,755	131,139	139,205	141,135	184,701	217,343	243,697	290,538	255,671	261,175

* F P C reports for 12 months ending November.

Table III—Number of Utility Customers at End of 1945*

	11 Western States			United States		
Class of Customer	1944	1945	Change	1944	1945	Change
Residential	3,524,178	3,590,000	65,822	27,371,260	28,000,000	628,740
Rural	353,318	380,600	27,282	1,144,241	1,220,000	75,759
Commercial and Industrial	638,724	659,000	20,276	4,415,047	4,562,000	146,953
Municipal Railway and Miscellaneous	19,479	19,395	—84	117,844	118,000	156
Total	4,505,699	4,648,995	113,296	33,048,392	33,900,000	851,608

* 1945 Estimated.

Table IV—Type and Capacity of Utility Generators, November 1945

			Total Capacity	Generator Capacity in Kilowatts of Plants Operated by (a)					
				Water Power		Steam Power		Internal Comb. Engines	
State	Companies*	Plants	Kw.	No.	Capacity	No.	Capacity	No.	Capacity
Arizona	18	50	668,274	15	540,790	9	84,675	26	42,809
California	27	162	3,378,617	120	1,982,165	26	1,348,100	16	48,352
Colorado	42	86	326,825	30	86,585	25	223,344	31	16,896
Idaho	16	55	267,578	44	263,856	1	400	10	3,322
Montana	21	40	373,432	22	358,274	4	11,968	14	3,190
Nevada	8	15	590,157	10	586,135	..	....	5	4,022
New Mexico	24	47	154,064	5	25,010	14	107,607	28	21,447
Oregon	23	71	902,426	51	713,029	12	184,550	8	4,847
Utah	27	76	171,407	58	92,445	4	68,750	14	10,212
Washington	23	61	1,823,625	44	1,619,280	10	202,320	7	2,025
Wyoming	31	50	82,711	14	49,440	11	27,537	25	5,734
11 Western States	260	713	8,739,116	413	6,317,019	116	2,259,251	184	162,856
United States	1,688	3,923	49,901,280	1,508	14,884,098	1,078	33,941,306	1,337	1,075,876

(a) For combination plants ecah type of prime mover is counted as a separate plant.
* Includes duplications because of companies operating in more than one state.
Source: Federal Power Commission.

Table V—11 Western States Regional Market Development

Item	Year	Amount	Per Cent of U. S. Total
Population	1940	13,833,265	10.54
Families	1940	4,135,440	11.86
Dwelling Units, Urban	1940	2,721,514	12.59
Dwelling Units, Rural	1940	1,820,319	11.58
Farms	1940	509,671	8.36
Crops and Livestock Value	1939	$1,512,561,000	16.59
Industry, Establishments	1939	21,000	11.67
Industry, Value of Products	1939	$4,729,155,000	8.32
Wholesale Establishments	1939	27,232	13.58
Wholesale Value of Sales	1939	$6,137,757,000	11.11
Retail Stores	1939	213,027	12.03
Retail Value of Sales	1939	$5,726,300,000	13.63
Passenger Auto Sales	1940	402,235	12.65
Effective Buying Income, Estimate (a)	1940	$9,171,281,000	12.36
Population, Resident Civilian	1944	14,980,500	11.77
Population, Resident Civilian and Military	1944	16,351,595	12.33
Retail Sales, Total Estimate	1944	$10,532,070,000	12.99
Food Store Sales	1944	$2,763,432,000	14.74
General Merchandise	1944	$1,589,268,000	14.58
Lumber, Hardware, Etc.	1944	$543,314,000	15.23
Drugs	1944	$413,208,000	14.43
Wholesale Sales, Estimate	1944	$13,378,451,000	12.99
Gross Farm Income	1944	$3,860,528,000	18.20
Bank Deposit Total	1944	$13,094,809,000	12.85
Demand	1944	$7,994,022,000	12.30
Time	1944	$5,099,787,000	13.80
Motor Vehicle Registrations	1944	4,971,500	16.50
Effective Buying Income, Estimate	1944	$22,178,135,000	14.94
Major War Supply-Facility Contracts and Project Orders—June, 1940, through December, 1944	....	$27,855,350,000	13.32

HIGHLIGHTS

Production Peak of wartime power demands was reached in 1944 when generators turned out 43,945 million kwh. In 1945 production dropped to 41,101 million kwh. as large energy-consuming metal plants closed down. Hydro plants delivered 87.6% of the total, continuing the program of fuel conservation initiated during the war.

Energy Use Industrial plants took the bulk of the power generated, although the proportional amount consumed declined as the war peaks passed. Domestic and commercial consumption continued to grow and major effort to absorb the war surpluses will be in these two important fields. Last year the West produced 9,210 kwh. per customer, compared to 6,660 kwh. per customer for the U.S.

Capacity New installed generating capacity in Western plants dropped slightly, due to rerating of older equipment. The total is now 8,739,116 kw., which is 17.5% of the U.S. total (population is only 11.8%). The West accounts for 42.5% of all of the hydro capacity in the country.

New Plants As the wartime surplus of generating capacity is used up, new facilities are being planned or constructed. Upwards of 159,000 kw. of new steam units are scheduled for California, while 1945 hydro additions in the region will exceed 50,000 kw. It will be 1947 and 1948 before any really large generating programs will be completed.

Expenditures New facilities, principally distribution, required expenditures of $69,500,000 in 1945, exclusive of funds spent by the federal government on power projects. Manpower and materials held back many needed projects.

Budgets Western utilities have budgeted $147,000,000 for new facilities for 1946. Federal appropriations for power projects will bring the total to well over $200,000,000, approaching an all-time record. Of the power company budgets, some $65,000,000 will be spent on distribution.

Customers Western power systems now serve 4,648,995 customers. The increase in 1945 was 113,296. The number of residential customers is now 3,590,000 and an additional 100,000 will be added in 1946 if building materials are available for new homes.

Industry Trend of industrial developments can be traced from wartime expansion of facilities in the West. Expenditures for new plants totaled some $4,955 million. Government provided all but $586 million. Here is how the investment was split: shipbuilding, $660 million; non-ferrous metals, $409 million; petroleum and chemicals, $397 million; iron and steel, $373 million; aircraft, $315 million; food, $146 million; ordnance, $108 million.

Construction A shortage of housing for the unprecedented growth in population throughout the West will create an immediate demand for 100,000 new dwelling units and similar numbers for the next five years. Store modernization, new store and office buildings, industrial conversion only await available materials.

Appliances If available there is an immediate market in the eleven Western states for 100,000 electric ranges, 750,000 refrigerators and relative amounts of all other household appliances.

Gigantic Program— But Execution Depends On Manpower

BUDGETED by power companies and municipal systems in the West, for construction of new and improved facilities during 1946 is well over 100 million dollars. In addition to this are the programs of the federal agencies.

But as plans are rushed to relieve the burden on overworked distribution plant, to re-orient systems for the accommodation of peacetime demands, a question remains as to the actual amount of work that can be got done this year. "Pending availability of manpower and materials"—the phrase repeats itself in numerous reports. And since the availability of materials is in turn dependent upon manpower, it is manpower which will determine the electrical program for 1946.

To Western systems as a whole, war's end and the launching of reconversion had little effect on demand. The West's retention of both population and industry accumulated during the war points toward continuing growth into an indefinite future. It has already caused upward revisions in the estimates of plant needed to accommodate growth in customers and loads.

Forty-six per cent of the money will go into distribution facilities, where a backlog of deferred modernization is superimposed on new customer demands. But in numerous cases the pinch extends all the way back to the generators.

Particularly is this true in southern California. Despite projects now being rushed to completion which will enable the region to draw an additional 175,000 kw. from Boulder Dam, several steam units will be installed this year and next. Those already scheduled will aggregate 159,000 kw. In addition, Imperial Irrigation District will add 14,400 kw. of hydro.

Other steam units to be added throughout the Western states will include a 9,375-kw. topping-turbine unit by Pacific Gas and Electric at Eureka, Calif., 7,500 kw. by Public Service Co. of Colorado, and 15,000 kw. by Southern Colorado Power.

Remaining units of consequence will be: 16,500 kw. of hydro by Idaho Power; 25,000 kw. of hydro by Tacoma City Light; 5,000 kw. of steam and 1,000 kw. of hydro by the City of Provo, Utah; 1,500 kw. of hydro by the City of Idaho Falls; and 1,100 kw. of internal combustion by Arizona Edison.

On the pages which follow are detailed reports which outline the construction programs in the West. Chief engineers and other executives of utility companies, municipal systems, and federal agencies have contributed generously of their time in summing up 1945 activities and in setting forth their plans for 1946. To this group of men go ELECTRICAL WEST's sincere thanks for the time they spent on details which make this forecast so complete.

Federal

Bonneville

Detailed activities of the Bonneville Power Administration are reported on page 90.

Bureau of Reclamation

Projects are listed under the states in which they are located. A tabulation of USBR current and future power development appears on page 92.

REA

In the last half of 1945, the Rural Electrification Administration received an unprecedented volume of applications for loans to finance new rural electrification developments. Between June 1 and Nov. 1, REA allotted $7,916,741 as loans to 123 borrowers in the eleven Western states, to extend electric service to nearly 12,000 farms and other rural consumers as quickly as materials and manpower could be obtained. These loans will enable the borrowers to make a start on their postwar programs.

In February 1945, the U. S. Dept. of Agriculture had published estimates which indicated that REA borrowers alone could extend electric service to 86,700 new rural consumers in the eleven states west of the 100° merid-

ian; within three years.

About 55% of the nation's farms still were without electricity in 1945. Farmers, who had wanted electricity for several years but had been unable to obtain service because of wartime restrictions on new rural power line construction, swamped existing REA-financed cooperatives with service applications. Other thousands joined newly organized cooperatives in areas which could not be reached with extensions from existing systems.

When the current fiscal year reached the half-way mark on Jan. 1, approved and pending loan applications were more than $117,000,000 in excess of the $200,000,000 which Congress had authorized for REA loans during the entire fiscal year. REA Administrator Claude R. Wickard estimated that REA borrowers in 21 states, including Colorado and New Mexico, already had borrowed the full amounts which could be loaned them from existing REA loan authorizations, although the fiscal year would not end until June 30, 1946.

Through Nov. 1 the cumulative total of REA loan allotments to Western borrowers amounted to $55,145,510. Funds advanced as loans from these allotments had been used by the borrowers to finance 29,940 mi, of rural lines serving 82,423 consumers.

Arizona

Arizona Power

The Arizona Power Co. was formed during 1945 by consolidation of The Arizona Power Corp., Prescott. and the Arizona Electric Power Corp., Flagstaff. About $400,000 is budgeted for 1946 additions and improvements.

No generating capacity was added during 1945, and the only transmission addition was a 5-mi., 44-kv. tap to Monte Cristo line to serve the Arizona Dredging Co.'s mining operations. This year a 60-mi., 66-kv. line is planned between Flagstaff and Winslow (initial operation at 44 kv.), and an 18-mi., 44-kv. tie line, between Williams and Bellemont is to be constructed to give duplicate service to Williams, Ash Fork, Seligman and Bellemont.

The second section of the Childs hydro plant outdoor substation will be built this year, continuing a program started at this substation before the war. Capacity of the Prescott substation will be increased by 1,500 kw.

In addition to the foregoing major items, the 1946 budget covers new business extensions and distribution improvements, together with associated equipment.—*Malcolm M. Bridgwater, general superintendent.*

Central Arizona L. & P.

Addition to the electric properties totaled about $500,000 in 1945 (some $215,000 more than was originally budgeted) while the 1946 electric budget is estimated at $656,000.

Three miles of 66-kv. transmission were constructed to connect a distribution substation in northern Phoenix, and a 10,000-kva., 66/12-kv. transformer with switching equipment was installed at this substation. Twenty miles of 44-kv. line feeding from Phoenix to the Tempe, Chandler and Gilbert territory were converted to 66-kv., completing a conversion program started in 1937.

Distribution line additions were about 60 mi., 80% rural. Capacity of one rural substation was increased by 1,500 kva. Distribution transformer purchases amounted to about $68,000, meters and metering equipment to $65,000; distribution cutover from 4 to 6.9 kv. cost about $16,000.

The 1946 program covers such items as supervisory, load and frequency control for the interconnection with other utilities, substation equipment, distribution improvements and transmission ties.

Distribution substation capacity will be increased 5,000 kva. at two Phoenix district substations by installing more unit type transformers with tap-changing-under-load equipment. A 10,000-kva., 66/12-kv., distribution substation will be added in the east part of Phoenix, and connected by about three miles of 66-kv. transmission

Glendale distribution substation will be converted from 12 to 66 kv. with 3,000-kva. transformer capacity, power being received from adjacent transmission.

These projects constitute the first part of postwar construction required to handle the loads which grew out of the emergency and to provide the improvements necessary for meeting further load increases.—*George H. Groh, chief engineer and general superintendent.*

Davis Dam, USBR

Construction of Davis Dam and power plant, which was stopped during the war, is expected to be resumed early in 1946. Bids for this work were received on Dec. 21, 1945. The power plant, when completed, will house five 45,000-kva. generators.

Parker Dam, USBR

Construction of 140 mi. of transmission line, from Parker Dam to Phoenix, Ariz., was completed. Terminal facilities at Phoenix and Parker were practically completed. It is expected that the line will be energized early in 1946. Additions to the Coolidge substation were completed in 1945.

Salt River Valley Assn.

In 1945, 2¼ mi. of line were added to the transmission system, and substation capacities increased 9,000 kva. During 1946, it is contemplated to construct approximately 11 mi. of 69- and 44-kv. lines at an estimated $30.000.

Due to the large increase of customers the capacities of the existing distribution substations were increased 13.500 kva. and two new stations of 500 kva. each were installed. To meet the expansion of the rural districts there was constructed 35 mi. of 11- and 2.3-kv. lines. The estimated expenditures for the above construction and new services added were $390,000.

Reports appear alphabetically under states

Arizona	81	Nevada	89
California	82	New Mexico	90
Colorado	88	Oregon	90
Idaho	89	Utah	93
Montana	89	Washington	93

Photo sources: pp. 80, 86, Pacific Gas and Electric; pp. 82, 93, 95, USBR; p. 83, Los Angles Department of Water & Power; p. 87, San Diego Gas & Electric; pp. 88, 89, Southern California Edison; pp. 90, 91, 94, Bonneville Power Administration; p. 94, City of Tacoma.

We expect to add 13,500 kva. to existing substations and construct new stations aggregating 13,200 kva. To this will be added approximately 25 mi. of 11- and 2.3-kv. lines. Contemplated expenditures: $320,000.—*F. L. Roe, supt. of power.*

Tucson G. E. L. & P.

Transmission facilities added in 1945 comprised 5.7 mi. of 13.8-kv. for serving irrigation load. That scheduled for 1946-47 is confined to normal growth.

Added distribution amounted to 11.5 mi. of line and 776 kva. of substation capacity in 1945. Contemplated betterments for this year involve cutting over seven feeders from 2.3 to 4 kv. Budgeted for the cutovers and other items is $50,000.

We will replace seven inadequate oil circuit breakers with metal-clad switchgear and will install a ground-fault neutralizer on the 45-kv. system.—*M. A. Pooler, president and general manager.*

California

Anaheim L. & W. Dept.

During 1946-47 we plan to add two miles of 11-kv. transmission, none having been added last year. Last year's program was confined to normal maintenance. In the year to come, $30,000 has been budgeted for improvements to the distribution system.—*V. W. Hannum, superintendent.*

Burbank

About $169,000 was spent for additions and improvements to the system in 1945, and the 1946 figure is estimated at $182,000. Maintenance figures for the two years are $170,000 and $160,000 respectively. In both years, roughly three fourths of the expenditures for plant improvement are in the distribution category.

In 1945, 3.6 mi. of transmission line were added to the system and substation capacity was increased by 11,737 kva. This year it is planned to bring in 2,500 kva. of substation capacity, and work will get under way on installation of another 5,000 kva. and on construction of a half-mile of transmission line.—*J. H. McCambridge, general manager.*

California Electric Power

Construction expenditures authorized in 1945 totaled $1,776,070, including $35,930 for generation, $25,230 for transmission, $1,060,502 for distribution, $511,882 for substations, and $142,586 for miscellaneous.

A total of $4,730,845 is tentatively scheduled for the two-year (1946-47) construction program.

In 1945 installation of water-storage control facilities and winding a generator stator were the major items of generation improvements, accounting for $27,548. Rerouting and reconstruction of transmission lines cost $20,156.

The distribution figure covered the construction of about 127 mi. of line (including 56 mi. of rural), extensions for new customers, and improvements of existing lines.

Under the substation heading, 25,712 kva. of transformer capacity were added (5,150 kva. at seven new substations and 20,562 kva. at existing stations), at an estimated $424,689.

Under other improvements, transportation equipment accounted for $79,680, building additions for $25,379, extension of FM radio system for $18,288, water system for a transmission station for $4,065, special tool equipment for $2,245, and small items for $12,929.

The proposed 1946 construction program breaks down as follows:

Generation	$80,995
Transmission	49,770
Distribution	741,540
Special extensions	719,725
Substations	287,310
General	417,590
TOTAL	$2,296,930

Principal items budgeted for 1946 include: Conversion of hydroelectric plant to remote control, $15,000; replacement of wood-stave pipe line, $23,800; construction of 56 mi. of transmission for interconnection $314,440; construction of approximately 100 mi. of line and 7,200 kva. in substation capacity to serve new areas, $390,285; cutover substations and primary lines for 4,800-volt operation, $72,595; cutover distribution line to 33-kv. operation, $4,270; new lines to connect new substations, $124,505; additional substation capacity (total of 13,325 kva.), $220,400; substation modernization $41,390; and purchase of motorized equipment $165,030. The appropriation for routine line extensions to new customers is set at $500,000.—*R. H. Halpenny, chief engineer.*

Central Valley Project, USBR

Work on the contracts for the equipment for the Shasta and Keswick power plants, which was halted during war, has been resumed. As noted under the Columbia Basin Project, the two Shasta units, which were temporarily installed in the Grand Coulee power plant for the duration of the emergency, are to be dismantled and installed in the Shasta power plant. Preparation is being made at the latter plant for the installation of the units there. It is expected that contracts will be let early in 1946 for the completion of Keswick Dam and power plant.

Work continued on Friant Dam, and it is expected to be completed in 1946.

Installation of generators in the Keswick power plant is scheduled to start late in 1946.

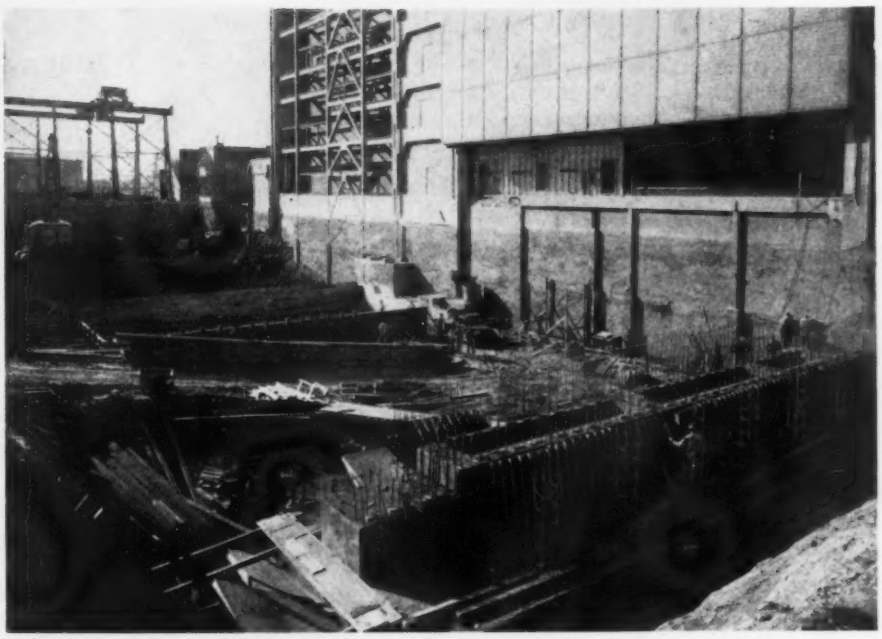
Construction of the Friant-Kern Canal was started in 1945 and will be continued under an accelerated program during 1946.

Coast Counties G. & E.

Substantial addition to our transmission capacity is becoming increasingly necessary and probably will be started during the year. Plans for this are not yet in final shape.

During 1945, very little modernization was possible because of manpower

Phoenix substation (south position shown) is at the receiving end of USBR's transmission line from Parker Dam. The 140-mi. line was completed in 1945, and is scheduled for operation early this year when terminals are completed



Construction under way here will accomodate a second 65,000-kw steam unit for Harbor plant of Los Angeles Dept. of W. & P. The new generator is scheduled to go into service in 1947

and material shortages. It is expected that work of this character on distribution lines will amount to about $94,000 this year. About 45 mi. of distribution lines were added to the system in 1945; to serve new customers this year we will probably add 90 mi. Static capacitors amounting to 900 kva. were added during 1945; we contemplate adding 2,500 kva. during 1946. Transformer capacity to be added in substations during 1946 amounts to 11,500 kva. including regulating equipment.—*A. E. Strong, general superintendent.*

Glendale P. S. Dept.

Due to the fact that a 20,000-kw. generator which we had planned to add to our steam plant was not released until about June 1, 1945, we cannot bring it into service in 1946 as we had expected. Installation of the boiler to serve this unit is just now starting, and it is now planned to have the machine on the line by mid-1947.

Preliminary studies are now being made for the addition of a 3,000- to 5,000-kw. distribution substation, supervisory controlled, in the south part of the city. The probable date of this installation is early 1947.

Currently, we are carrying on the normal betterments and expansion of the distribution system. As we had little so-called "war load," the ending of hostilities had little effect on our system. The 26,000-kw. peak we had in late December is the largest we have ever had and is in line with the normal growth through the years.—*P. Diederich, superintendent of public services.*

Imperial Irrigation District

Scheduled additions to our hydro generating capacity at Drops No. 3 and No. 4 will add 4,800 kw. and 9,600 kw. respectively, while at El Centro we shall install a 20,000-kw. steam unit, planned for an eventual capacity of 40,000 kw.

To provide additional capacity from hydro plants to El Centro, we added 24 mi. of 88-kv. transmission. Extensive transmission construction is scheduled as follows: construct 80 mi. of 88-kv. line from El Centro to Coachilla; rebuild 25 mi. of 88-kv. Y-line from Drop No. 4 to El Centro; complete 20 mi. of 33-kv. loop line from Westmorland to Niland; rebuild 25 mi. of 88-kv. C-line from El Centro to Calipatria; add 12-mi., 33-kv. tie line from El Centro to Holtville; add 5.5-mi., 88-kv. line from Drop No. 3 to Drop No. 4.

The distribution and substation program provides for consolidation of Imperial Irrigation District system with that taken over from the California Electric Power Co., for general improvements all over the system, and for the addition of 25,000 kva. of 88/34.5-kv. substation capacity at Drop No. 4.

Other improvements will include increasing the system's interrupting capacity by adding oil circuit breakers and extending the applications of supervisory control.—*N. Pike, chief electrical engineer.*

Los Angeles Dept. of W. & P.

The 1945 program was limited to meeting the demands of war industries. The proposed 1946 construction program entails an estimated $17,000,000 including funds to resume projects deferred during the war.

The 1945 program made no changes in generating capacity or transmission facilities. The distribution system was extended by the addition of: 5.5 mi. of 138-kv. underground, 0.3 mi. of 34.5-kv. underground, 8.8 mi. of low-voltage underground, 1.8 mi. of 34.5-kv. line, 20 mi. of low-voltage primary lines, 14 mi. of low-voltage secondary lines, 10,500 kva. of transformers at distribution stations, 25,630 kva. at industrial stations, and 2,850 kva. at commercial stations.

The following are the major projects proposed by the department, the extent of activity depending on availability of materials.

At Harbor steam plant a 4,000-kw. house unit will be placed in service early in the year. Construction will continue for a second 65,000-kw main unit to be placed in service in 1947, in which year a second 4,000-kw. house unit is also scheduled. The second main unit will be connected to the distribution system by a 138-kv. underground cable.

A 75,000-kva. transformer bank is to be installed at Receiving Station F, including associated 138- and 34.5 kv. switch positions. A 60,000-kva. synchronous condenser and a new control house will also be added to this station.

The 132-kv. single-circuit line between Receiving Stations B and D will be completed in 1946, improving the capacity of the Boulder transmission by approximately 40,000 kw.

Two new distribution stations will be started in 1946; Station 28, 40,000 kva., and Station 49, 10,000 kva. Additions to existing distribution stations will increase their capacity by 53,000 kva.

The distribution system will be further extended by the following: 25,000 kva. of transformers at industrial stations, 5,700 kva. of transformers at commercial stations, 8 mi. of 34.5-kv. underground cable, 23 mi. of low-voltage primary underground cable, 47 mi. of low-voltage secondary underground cable, 5 mi. of 34.5-kv. overhead, 40 mi. of low-voltage primary overhead, and 30 mi. of low-voltage secondary overhead.

In addition, conversion of the 2,300- and 4,000-volt systems to 5,000-volt operation will be resumed. Oil circuit breakers will be remodeled to higher interrupting capacity where necessary. Supervisory control will be used in the future as it has been used in the past. —*C. P. Garman, chief electrical engineer and deputy general manager.*

Pacific Gas and Electric

Total expenditures for new generating facilities, transmission extensions, and improvement and extensions of the distribution system during 1945 amounted to some $12,800,000. The major subdivisions of the program are given below. For 1946, the total for similar purposes is estimated in excess of $30,000,000, dependent upon what materials and manpower are actually available.

The coming year will be the first of a series of several during which particular emphasis will be placed upon extensions and modernizations of the company's facilities which have long been held in abeyance for postwar attention when equipment, material, and labor could again be devoted to such purposes.

Generation

After the addition to the system of 160,000 kva. of hydroelectric generating capacity through the completion of the Pit No. 5 project in 1944, no further increase in capacity, either steam or hydro, was programmed for 1945. The continuation of the war effort during the first half of 1945 was reflected in continuing, though moderate, growth of load to a peak in July of that year.

With the suspension of hostilities and the loss of shipyard and other war loads, however, it is now expected that the 1945 peak will be exceeded in 1946. In view of that fact, no new capacity is scheduled for 1946 other than a 9,375-kva. topping turbine at Station "B," Eureka. With this item will be included the reconstruction of two of the main boilers of the existing plant for 600-lb. pressure.

Transmission

During the greater part of the year, the necessity for the conservation of critical materials, as well as manpower, limited the company's transmission construction to the minimum consistent with serving essential loads. Extension into new territory required some 13 mi. of 60-kv. line. An equal mileage was required in rerouting twin-circuit steel pole lines in the vicinity of McClellan Field, to clear airport expansion, and in ties for the improvement of system operating conditions.

With the removal of restrictions on materials and the improvement of the manpower situation, the company has under construction, or definitely programmed for 1946, several important transmission extensions, such as:

(a) 185 mi. of 220-kv. circuit, between Shasta and Newark Substations, now under construction, to be finished

Status of Western REA-Financed Systems

System	Borrower's Name	Cumulative Construction Allotments Dec. 6, 1945	1945 Construction Allotments	Miles Energized 10/31/45	Consumers Connected 10/31/45
ARIZONA	**State Totals**	**$ 1,326,000**	.....	**632(a)**	**2,267(a)**
2 S.E.	Stonewall Electric Co., Tucson	100,000	.....	113(a)	226(a)
4 Pinal	San Carlos Irrig. & Drain. Dist., Coolidge	145,000	.....	117	332
14 Cochise	Surphur Springs V. Elec. Co-op, Inc., Willcox	1,063,000	.....	402(a)	1,709(a)
16 Mohave	Littlefield Elec. Co-op., Inc., Littlefield	18,000	.....	(*)	(*)
CALIFORNIA	**State Totals**	**$ 2,654,500**	**$ 185,000**	**1,502(a)**	**4,635(a)**
1 Imperial D.P.	Imperial Irrig. Dist., Imperial	700,000	.....	700(a)	2,153(a)
6 Modoc	Surprise V. Elec. Corp., Alturas	798,500	.....	455(a)	1,064(a)
16 Plumas	Plumas-Sierra R.E. Co-op., Portola	392,000	.....	245(a)	764(a)
18 San Diego	Mt. Empire Elec. Co-op., Inc., Campo	229,000	75,000	102(a)	654(a)
24 Bard	Bard Laguna Elec. Co-op., Inc., Bard	25,000	.....	(*)	(*)
27 Humboldt	Redwood Elec. Coop., Inc., Garberville	400,080	.....	(*)	(*)
30 Butte	Feather Falls Elec. Co-op., Inc., Feather Falls	110,000	110,000	(*)	(*)
COLORADO	**State Totals**	**$13,099,551**	**$1,124,741**	**7,448(a)**	**21,671(a)**
7 Mesa	Grand V. Rur. Pow. Lines, Inc., Grand Junction	430,500	.....	332	1,438
14 Alamosa	San Luis V. R.E. Co-op., Inc., Monte Vista	797,500	.....	525	1,184
15 Morgan	Morgan Co. R.E. Assn., Ft. Morgan	1,095,000	.....	650	1,306
16 Jefferson	Intermountain R.E. Assn., Littleton	1,186,000	375,000	673(a)	2,150(a)
17 Prowers	S.E. Colo. P. Assn., LaJunta	1,704,310	234,000	1,150	2,986
18 Gunnison	Gunnison Co. Elec. Assn., Inc., Crested Butte	338,000	.....	123	379
20 Delta	Delta-Montrose R.P. Lines Assn., Delta	588,000	.....	530(a)	1,345
21 S.E.	Stonewall Electric Co., Trinidad	103,741	64,741	28	189
22 Boulder	Union R.E. Assn., Inc., Brighton	618,000	130,000	474(a)	1,391(a)
25 Pueblo	San Isabel Elec. Assn., Inc., Pueblo	264,000	50,000	168	526
26 San Miguel	San Miguel Power Assn., Inc., Nucla	256,000	.....	133	652
29 Phillips	High Line Elec. Assn., Holyoke	1,858,500	.....	897(a)	1,720(a)
31 Larimer	Poudre V. Elec. Assn., Inc., Fort Collins	661,000	.....	696	1,704
32 LaPlata	LaPlata Elec. Assn., Inc., Durango	286,000	.....	230	712
33 Dolores	Empire Elec. Assn., Inc., Cortez	618,000	.....	130	1,610
34 Eagle	Holy Cross Elec. Assn., Inc., Eagle	474,000	.....	137(a)	575(a)
35 Chaffee	Sangre De Cristo Elec. Assn., Inc., Salida	382,000	70,000	62(a)	333(a)
36 Routt	Yampa V. Elec. Assn., Inc., Steamboat Springs	185,000	.....	190	293
37 Douglas	Mt. View Elec. Assn., Inc., Limon	1,254,000	193,000	320	1,169
IDAHO	**State Totals**	**$ 4,662,750**	.....	**3,130(a)**	**7,743(a)**
4 Bonner	N. Ida. R.E. Rehabil. Assn., Sandpoint	1,009,750	.....	471	1,186
10 Nez Perce	Clearwater V. L. & P. Assn., Inc., Lewiston	1,468,000	.....	1,247	2,660
11 Kootenai	Kootenai R.E. Assn., Inc., Coeur D'Alene	331,000	.....	286	1,295
14 Valley	Long V. Pow. Co-op., Inc. Donnelly	346,000	.....	165(a)	419(a)
15 Idaho	Ida. V. L. & P. Assn., Inc., Grangeville	339,000	.....	304	533
16 Cassia	Raft River R.E. Co-op., Inc., Malta	411,000	.....	135(a)	275(a)
17 Fremont	Fall River R.E. Co-op., Inc., Ashton	364,000	.....	305(a)	716(a)
19 Butte	Lost River Elec., Co-op., Inc., Mackay	229,000	.....	100(a)	524(a)
21 Camas	Prairie P. Co-op., Inc., Fairfield	165,000	.....	117	135
MONTANA	**State Totals**	**$ 7,536,598**	**$3,570,000**	**3,344(a)**	**8,244(a)**
1 Ravalli	Ravalli Co. Elec. Co-op., Inc., Corvallis	272,800	70,000	188(a)	531(a)
2 Cascade	Sun River Elec. Co-op., Inc., Fairfield	767,500	285,000	590(a)	1,192(a)
5 Richland	Lower Yellowstone R.E. Assn., Inc., Sydney	176,600	.....	187	532
9 Yellowstone	Yellowstone Elec. Co-op., Inc., Huntley	533,498	125,000	406	1,367
10 Madison	Vigilante Elec. Co-op., Inc., Dillon	960,000	465,000	348(a)	816(a)
12 Missoula	Missoula Elec. Co-op., Inc., Missoula	307,000	50,000	248	443
13 Flathead	Flathead Elec. Co-op., Inc., Kalispell	413,700	160,000	200	642
15 Fergus	Fergus Elec. Co-op., Inc., Lewiston	491,999	105,000	434	648
16 Park	Park Elec. Co-op., Inc., Livingston	238,000	.....	101	325
17 Rosebud	Mid-Yellowstone Elec., Co-op., Inc., Hysham	188,500	.....	133(a)	402(a)
19 Stillwater	Beartooth Elec. Co-op., Inc., Red Lodge	432,000	130,000	286	644
21 Big Horn	Big Horn Co. Elec., Co-op., Inc. Lodge Grass	397,000	143,000	210	564
24 Blaine	Big Flat Elec., Co-op., Inc., Turner	294,000	249,000	(*)	(*)
25 Sheridan	Sheridan Co. Elec. Co-op., Inc., Westby	450,000	413,000	(*)	(*)
26 Valley	N. Elec. Co-op., Inc., Opheim	440,000	395,000	(*)	(*)
27 Glasgow	Valley Co. Elec. Co-op., Inc. Glasgow	195,000	.....	(*)	(*)
28 McCone	McCone Co. Elec. Co-op., Inc., Circle	550,000	550,000	3(a)	138(a)
29 Wibaux	Goldenwest Elec. Co-op., Inc., Wibaux	430,000	430,000	(*)	(*)
NEVADA	**State Totals**	**$ 296,000**	**$ 37,000**	**121(a)**	**463(a)**
3 Alamo D.P.	Alamo P. Dist. No. 3, Pioche	69,000	37,000	(*)	(*)
4 Overton D.P.	Overton P. Dist. No. 5, Overton	227,000	.....	121(a)	463(a)

NEW MEXICO	**State Totals**	**$ 3,774,500**	**$1,836,000**	**1,449(a)**	**4,797(a)**
4 Eddy	Central V. Elec. Co-op., Inc., Artesia	416,000	50,000	230	755
8 Roosevelt	Roosevelt Co. Elec. Co-op., Inc., Portales	372,000	50,000	255	843
9 Curry	Farmers Elec. Co-op., Inc., Clovis	773,000	474,000	458	891
11 Taos	Kit Carson Elec. Co-op., Inc., Taos	430,000	60,000	59	727
12 Otero	Otero Co. Elec. Co-op., Inc., Cloudcroft	676,000	531,000	80(a)	337(a)
13 S.E.	Stonewall Elec. Co., Albuquerque	224,500	10,000	327(a)	520(a)
14 Mora	Mora-San Miguel Elec. Co-op., Inc., Mora	273,000	96,000	(*)	(*)
17 Sierra	Sierra Elec. Co-op., Inc., Hillsboro	100,000	.....	(*)	(*)
19 Colfax	Springer Elec. Co-op., Inc., Springer	150,000	205,000	(*)	(*)
20 Soccorro	Soccorro Elec. Co-op., Inc., Soccorro	360,000	360,000	40(a)	724(a)
OREGON	**State Totals**	**$ 7,930,000**	**$2,855,000**	**2,972(a)**	**10,542(a)**
2 Lane	Blackly-Lane Co. Co-op. Elec. Assn., Blackly	312,000	.....	95(a)	436(a)
4 Lincoln	Benton-Lincoln Elec. Co-op., Inc., Corvallis	1,035,000	.....	597	1,718
5 Clatsop	Nehalem V. Co-op. Elec. Assn. Jewell	119,000	.....	53(a)	227(a)
14 Umatilla	Umatilla Elec. Co-op., Assn., Hermiston	308,000	.....	271(a)	798(a)
16 Malheur	Malheur Co-op. Elec. Assn., Vale	409,000	97,000	272(a)	465(a)
17 Douglas	W. Douglas Elec., Co-op., Inc., Roseburg	883,000	63,000	401	1,355
18 Eugene	Lane Co. Elec. Co-op., Inc., Eugene	1,060,000	350,000	272	1,453
19 Jordan Valley	Jordan V. Elec. Co-op., Inc., Jordan Valley	30,000	.....	4	91
21 Coos	Coos Elec. Co-op., Inc., Coquille	980,000	.....	242	1,155
22 Clackamas	N.E. Clackamas Co. Elec. Co-op., Inc., Sandy	179,000	880,000	89	299
24 Tillamook D.P.	Tillamook U. Dist., Tillamook	100,000	100,000	(*)	(*)
25 Deschutes	Central Elec. Co-op., Redmond	352,000	15,000	294	736
26 Wasco	Wasco Elec. Co-op., Inc., The Dalles	1,045,000	692,000	302	547
27 Harney	Juntura Elec. Co-op., Inc., Juntura	148,000	148,000	(*)	(*)
29 Morrow	Columbia Basin Elec. Co-op., Inc., Heppner	510,000	510,000	(*)	(*)
32 Columbia	W. Ore. Elec. Co-op. Elec., Inc., Vernonia	460,000	.....	80	1,262
UTAH	**State Totals**	**$ 1,553,000**	**$ 208,000**	**726(a)**	**2,515(a)**
6 Garfield	Garkane P. Assn., Inc., Richfield	664,000	70,000	241(a)	1,056(a)
8 Duchesne	Moon Lake Elec. Assn., Inc., Mt. Emmons	708,000	.....	472	1,414
9 Beaver	Beaver V. Elec. Co-op., Inc., Beaver City	12,000	.....	13(a)	45(a)
10 Iron	Escalante V. Elec. Assn., Inc., Newcastle	100,000	100,000	(*)	(*)
11 Millard	Flowell Elec. Assn., Inc., Fillmore	31,000	.....	(*)	(*)
14 Washington	Dixie R.E. Co-op., St. George	38,000	38,000	(*)	(*)
WASHINGTON	**State Totals**	**$ 9,390,611**	**$ 960,000**	**6,263(a)**	**14,270(a)**
8 Benton	Benton R.E. Elec. Assn., Prosser	593,500	137,000	415(a)	1,195(a)
9 San Juan	Orcas P. & L. Co., Eastsound	476,000	.....	118	755
14 King	Mutual P. & L. Assn., North Bend	22,219	.....	15(a)	39(a)
17 Klickitat D.P.	PUD No. 1 of Klickitat Co., White Salmon	550,000	.....	82(a)	334(a)
18 Spokane	Inland Emp. R.E., Inc., Spokane	2,130,000	.....	2,387	4,072
20 Columbia	Columbia Co. R.E., Inc., Dayton	356,000	.....	360(a)	524(a)
23 Grays Harbor	Quinault L. Co., Quinault	82,000	.....	24(a)	173(a)
25 Cowlitz	PUD No. 1 of Cowlitz Co., Longview	201,192	.....	185(a)	680(a)
27 Lewis D.P.	PUD No. 1, Chehalis	416,500	.....	318	1,430
28 Kittitas D.P.	PUD No. 1 of Kittitas, Ellensburg	211,000	.....	181	341
30 Stevens	Stevens Co. Elec. Co-op., Inc. Colville	673,000	.....	545	1,158
31 Chelan	Chelan Co. Elec. Co-op., Inc., Leavenworth	116,000	.....	42	136
32 Okanogan	Okanogan Co. Elec. Co-op., Inc., Winthrop	183,500	.....	118	340
35 Pend Oreille	Pend Orielle Elec. Co-op., Inc., Newport	341,000	.....	240(a)	443(a)
36 Adams	Big Bend Elec. Co-op., Inc., Ritzville	432,000	.....	385	364
37 Lincoln	Lincoln Elec. Co-op., Inc., Davenport	642,000	.....	694(a)	643(a)
39 Hespelem	Hepselem V. Elec. Co-op., Inc., Hespelem	108,000	.....	49	329
42 Clallam D.P.	PUD No. 1 of Clallam Co., Forks	553,000	370,000	21(a)	422(a)
45 Grant D.P.	PUD No. 2 of Grant Co., Soap Lake	359,000	.....	24(a)	577(a)
46 Ferry D.P.	Ferry PUD No. 1, Republic	420,000	420,000	(*)	(*)
47 Douglas D.P.	PUD No. 1 of Douglas Co., Waterville	524,000	33,000	80	315
WYOMING	**State Totals**	**$ 4,089,000**	**$ 467,000**	**2,410(a)**	**6,138(a)**
3 Fremont	Riverton V. Elec. Assn., Inc., Riverton	281,000	10,000	296	562
5 Big Horn	Big Horn R.E. Co., Basin	411,000	.....	411	978
6 Goshen	Wyrulec Co., Lingle	527,000	.....	318	943
9 Uinta	Bridger V. Elec. Assn., Inc., Mountain View	121,000	.....	121(a)	349(a)
10 Platte	Wheatland R.E. Elec. Assn., Wheatland	253,000	100,000	90(a)	238(a)
11 Lincoln	Lower V. P. & L., Inc., Freedom	420,500	.....	213	849
12 Park	Garland L. & P. Co., Powell	72,300	.....	70(a)	189(a)
13 Washakie	Washakie R.E. Co., Worland	56,500	.....	60	162
14 Laramie	R.E. Co., Pine Bluffs	1,009,000	.....	517(a)	887(a)
16 Hot Springs	Hot Springs Co. R.E. Assn., Thermopolis	125,000	37,000	(*)	(*)
17 S.E.	Stonewall Elec. Co., Trinidad	78,700	.....	165(a)	440(a)
21 Carbon	Carbon P. & L. Co., Saratoga	364,000	50,000	57(a)	403(a)
23 Shoshone	Shoshone River Power, Inc., Cody	150,000	50,000	92	135
24 Sheridan	Sheridan-Johnson R.E. Assn., Sheridan	220,000	220,000	(*)	(*)

(*) Not energized
(a) Estimate

in 1946. This involves 140 mi. of new tower line and 145 mi. of new circuit to be strung on existing tower lines.

(b) An additional 50 mi. of 220-kv. single circuit on double-circuit towers from Vaca-Dixon substation to a new major substation at Moraga, including a special high crossing over the Carquinez Strait.

Construction of the above lines will serve to increase the outlet of power from Shasta Dam as well as the Pit River plants.

(c) A 110-kv. tie line between Winters and Fulton, to deliver more power to the Redwood Empire section. This will involve approximately 84 circuit miles on twin-circuit towers.

(d) Approximately 70 mi. of 60-kv. pole line, to supply various communities between Willits and Eureka.

(e) Extensions, totaling 85 mi. of 60-kv. line, into new territory in the Redwood Empire area.

Several substantial changes in transmission-line routing are contemplated to accommodate main highway construction and the projected establishment of freeways, as well as airport runway extensions. The above changes will affect all transmission voltages, from 60 to 220 kv.

Distribution

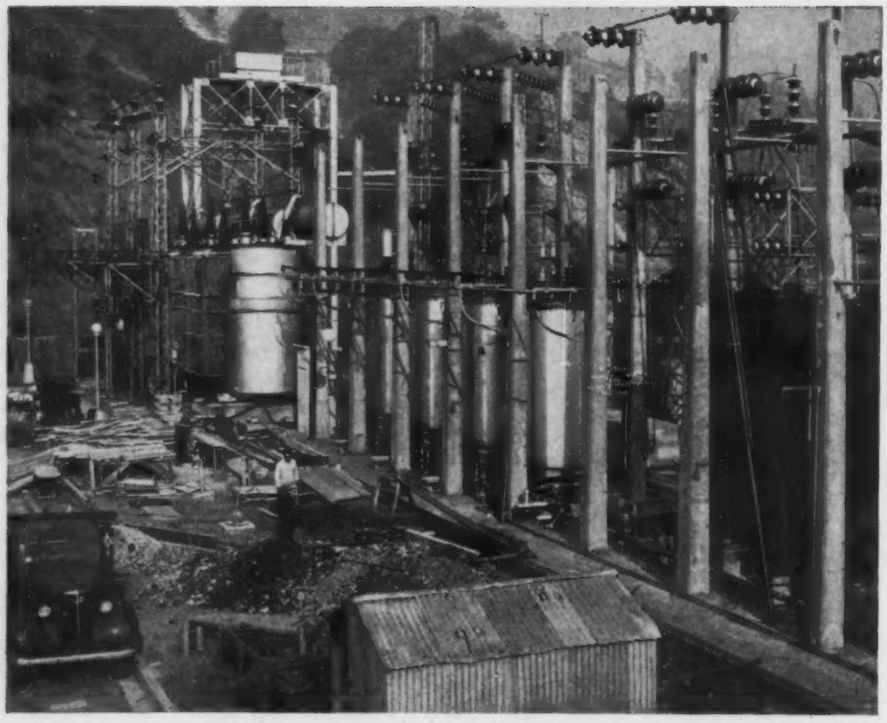
During 1945, some 1,000 mi. of distribution lines were added to the system. Also 10,500 kva. of static capacitors were installed. The total amount expended for these purposes during the year was in excess of $2,000,000.

With increased availability of construction materials and manpower, it probably will be possible to add 2,500 mi. of distribution circuit during 1946. Because of wartime restrictions, the extent of rebuilding and modernization of distribution facilities was held to the minimum. Such materials and labor as were available were devoted to the more pressing extensions of the distribution system.

Substation

New transformer capacity in substations of all types totaled 110,000 kva. during 1945. In addition some 25,000 kva. of synchronous condenser capacity were installed in substations Aside from the synchronous condenser installed at Herndon substation, the above additions were distributed generally throughout the system.

For 1946, plans are in process for major distribution changes and betterments budgeted at $10,000,000. Included in this will be additions of 220,000 kva. in substation capacity. It is further planned to modernize a number of oil circuit breaker installations,



Additional substation capacity on the Pacific Gas and Electric system will aggregate 220,000 kva. in 1946, if shortages do not necessitate a curtailment. Preparations shown above are for addition of a transformer bank at Claremont

some 95 high-voltage units being scheduled for replacement or rebuilding. Many more low-voltage units will receive attention, in a program extending into 1947.

Supervisory control will be extended to one 110-kv. switching station and two 60-kv. switching points under the company's construction program.

The company looks forward to a very active construction year in 1946, in these and many other fields, as equipment and materials become more readily obtainable and construction manpower becomes more plentiful.—*I. C. Steele, chief engineer.*

Typical of construction to be seen throughout the West this year is this scene at Pacific Gas and Electric's station H; the foundations are for new transformers

Pasadena L. & P. Dept.

Within the next three years, probably in 1948, we will install a steam generating unit of 35,000 or 40,000 kw. and will rebuild the control room for all generating and transmitting facilities. Two miles of 34-kv. overhead will be replaced with 34-kv. underground, and 5 mi. of 17-kv. underground will be added.

Distribution developments will involve the complete replacement of one 10,000-kw. substation, the addition of 10,000 kw. of capacity at other stations, and the installation of 10 to 15 mi. of 2,400-volt feeders. The last item is scheduled for 1946.

General improvements in distribution facilities other than the main station mentioned above probably will involve up to $150,000 per year for transformers and branch feeder circuits.—*E. L. Bettannier, general manager.*

Riverside E. L. & W. Dept.

Practically no distribution lines were added in 1945. We are, however, in process of constructing three miles of feeder circuit, mostly underground, to cost about $75,000. Transformer capacity at one substation was increased in 1945 by 1,000 kva.

Our major project for 1946 is changing some 10,000 to 14,000 consumers from 50- to 60-cycle service. Ground work is now under way, and it is expected that most of the physical work will be completed before year's end at an estimated $130,000.

War's end resulted in an increased gain in energy sales with a slight decrease in load factor. Every indication points toward further, more rapid increases in energy sales for the coming year; we anticipate that the gain in consumers for 1946 will exceed the largest yearly gain during the late 20's.—*L. W. Grayson, superintendent.*

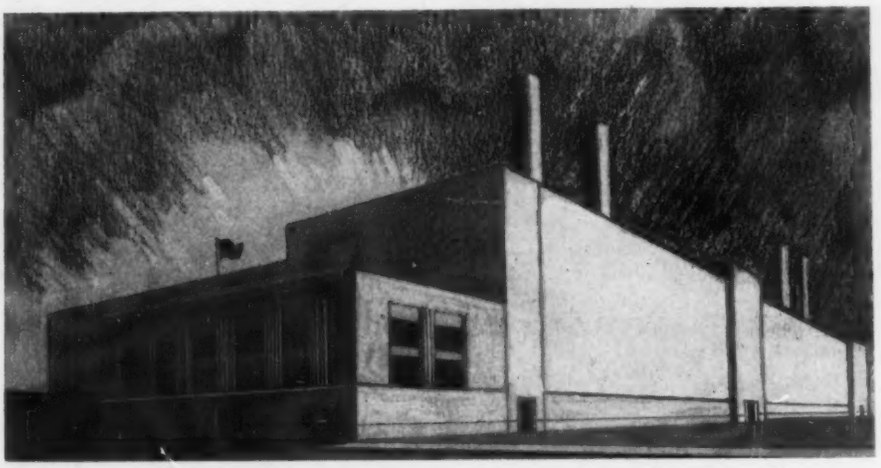
San Diego Gas & Electric

With the cessation of war, our construction program was turned from the service of war factories and military establishments to taking care of new domestic and commercial customers, extensions to whom had been impossible during the war years. Many such customers were accommodated during the final months of 1945, but there is still a considerable backlog of this type of business, for which service extensions will be made during 1946. One of the largest extensions made in 1945 brought lines to the Borego Valley, where there has been a considerable increase in farm development.

The company made no new addi-

tions to generating capacity during the past year, but has just contracted for a new turbogenerator, a 50,000-kw. unit which will comprise the second machine for Silver Gate station. It is expected that this unit will be in operation in the fall of 1947. Like the first 35,000-kw. unit, it will operate at 850 psi. and 925°F. There will be two boilers, each rated at 300,000 lb. of steam per hour.

No additions to the transmission system were made during the past year. Sixty-three miles of 66-kv. line are contemplated for the years 1946-47. These will involve extensions into suburban and rural territory, particularly to Descanso and to the Otay-Tia Juana section, to provide for rapidly growing loads. Fifteen thousand kilowatts of substation capacity were added in 1945, and existing stations were increased by a similar amount through the installation of fans.



Autumn 1947 is revealed by this artist's sketch of San Diego Consolidated's Silver Gate station after enlargement to accommodate a 50,000-kw. unit, now on order. Like the first (35,000-kw.) unit it will operate at 850 psi., 925 deg. F.

The company's construction budget for the years 1946 and 1947 will approximate $12,000,000, which includes $5,750,000 for the new unit at Silver Gate. The rate of expenditure and the division between the two coming years will depend on the availability of labor and material.

While activity in the aviation industry was on the decline even before the cessation of hostilities, other elements of war activity in this area continued unabated, particularly that of the U.S. Navy. The population shifts which were originally expected, while material, have not been as great as were contemplated, and it now appears that the loss in population following the curtailment of war production will be less than was once expected.

The keynote of the company's policy for the future, as in the past, will be an adequate power supply for all customers—military, industrial, commercial, agricultural, and domestic—and a thorough territorial coverage.—*L. M. Klauber, vice-president and general manager.*

Southern California Edison

In 1945 we spent approximately $11,000,000 for additions to plant and improvements to existing facilities.

Our 1946 budget is one of the largest we have had for a good many years, totaling $21,500,000 for system betterments.

In addition, it is contemplated we will spend $5,000,000 in 1946 for conversion of consumers' equipment from 50 cycles to 60 cycles. The first official step in this project, which will be one of the biggest in Edison history, was taken by the company June 12, 1945, when an application was filed with the California Railroad Commission to change to 60 cycles that part of our system now served at 50 cycles. This includes all of our service territory except in the San Joaquin Valley. The application has been approved by the California Railroad Commission and we have organized a frequency change department to take care of the work.

No new generating capacity was added to the system during the year, but with the completion of the third Boulder circuit, and the installation of Highgrove substation, 135,000 kw. of additional generating capacity will be made available.

No new generators will be installed, but greater use will be made of the generating facilities which were installed at Boulder power plant for use of Metropolitan Water District.

Approximately 250 mi. of transmission lines were constructed during 1945, the most important single item being the 130-mi. section of 220-kv. line from Hayfield to Chino. This, in conjunction with the Metropolitan Water District's Boulder-Hayfield 220-kv. line, creates the third 220-kv. Boulder line for the Edison system. This line will operate at 60 cycles and will be connected to the 50-cycle system through the existing 50,000-kw. frequency changer set at Chino, and a new 50,000-kw. frequency changer set which is being installed at Highgrove substation and which will be ready for service in the early part of 1946.

Highgrove is a new, major 220-kv. substation being built in connection with the third Boulder circuit. It is located in the outskirts of Highgrove, between the cities of Colton and Riverside, and is designed to serve the east-end load.

In 1945 approximately 250 mi. of distribution lines were constructed. Twenty-four thousand new customers were connected to our lines. Six new substations were built, which, together with additions to existing stations, increased the substation capacity by 108,000 kva.

During 1946, we plan to build about 150 mi. of transmission lines, and about 300 mi. of distribution lines, including some rural extensions.

It is also planned to add approximately 60,000 kva. of capacitors to the 4-kv. distribution system, and 22,000 kva. to the 12-kv. distribution system.

Eighteen new substations with a total transformer capacity of 380,000 kva. are planned, including the Highgrove substation transformer.

Much of the material has been ordered for the installation of supervisory control equipment in eight major stations and 35 transmission and distribution substations.

In 1923, the 150-kv. transmission lines and major substations were converted to 220-kv. operation. About half the 220-kv. oil circuit breakers now in use were installed in connection with this cutover. Since that time the addition of a number of 220-kv. lines, new generating stations, and synchronous condensers have greatly increased the duty of all of the oil circuit breakers.

Plans have been under way for some time and orders for material and items of equipment have been placed, anticipating the modernization in 1946 of eighty-six 220-kv. oil circuit breakers. Thirty-one of these breakers will be rebuilt with new mechanisms of the pneumatic type, and new interrupters so as to give these breakers an interrupting capacity rating of 3½ million kva. with an opening time of 3 cycles. Fourteen of these will be rebuilt in a similar manner with a rating of 3 million kva. at 5 cycles. Forty-four are to be rebuilt using the old mechanisms and will have a rating of 2½ million kva. at 5 cycles.

Third 220-kv. link with Boulder power for Southern California Edison, shown here under construction, was placed in service at midnight Dec. 31, 1945. Together with Highgrove substation it will give Edison an additional 135,000 kw. For details see this page and p. 87

Due to the greater demands made upon the Long Beach steam plant during the war years, considerable maintenance work has been necessary. It is contemplated this program will be completed in 1946.

The scarcity of manpower and material during the war years deferred considerable maintenance work on some of our waterways and tunnels in connection with our hydroelectric plants.

Since the end of the war, considerable maintenance work has been done which has improved the hydraulic characteristics and regained lost capacity of the Ward Tunnel on the Big Creek project, Kern River No. 3 tunnels, siphon and penstocks, and the Borel and Waweah flumes and canals.

During 1945 several small creeks flowing into the South Fork of the San Joaquin River were diverted into Florence Lake by means of small dams and diversion pipes. This water will be used through existing power plants and, under average stream flow conditions, will produce approximately 41,000,000 kwh. of energy annually, thus saving approximately 90,000 barrels of oil a year.—*N. B. Hinson, vice-president and executive engineer.*

Turlock Irrigation Dist.

Only necessary maintenance and a temporary addition in transformer capacity were undertaken in 1945. Scheduled for 1946 construction are a new substation, some 14 mi. of 66-kv. transmission line and the modernization of transmission features at an existing substation.—*L. H. Parker, electrical engineer.*

Colorado

Colorado-Big Thompson, USBR

Construction of Shadow Mountain Dam and dikes continued through 1945, and will be completed by the end of the year except for riprap. Placing of concrete lining in the Continental Divide tunnel is continuing, and is now approximately 50% complete, and is expected to be completed this spring. An accelerated program, contemplated in the event funds contained in the deficiency bill become available, includes the starting of construction of Granby Dam, Granby pumping plant, and pump canal in the fiscal year of 1946. It is also contemplated that work will be started in the development of the eastern slope power facilities which include the Aspen Creek siphon, Ramshorn tunnel, Prospect Mountain tunnel and conduit, and Mary's Lake and Estes Park power plants. Work contemplated to start in 1946 for eastern-slope irrigation facilities includes the Horsetooth Reservoir dams.

Colorado Springs P. U. Dept.

During 1945, 5,000 kw. of generating capacity were added at the steam plant. Transmission and distribution line construction was about the prewar annual average. A new distribution substation was built, and 100 15-kva. static capacitors were added.

The 1946 budget provides for ordinary extensions and betterments in the amount of $45,000. No major distribution changes are planned. Preliminary street lighting improvements are budgeted at $10,000 and spray-pond and tunnel construction at the steam plant at $50,000.—*H. H. Wiley, superintendent.*

Public Service of Colorado

Electric department construction for 1945 amounted to about $1,000,000, some 60% of it going for distribution. This year's figure will be approximately $2,200,000, divided about 50% for distribution and substation facilities, 20% for transmission, 15% for plant betterment, and 15% for miscellaneous.

Construction may get under way this year on an additional 7,500 kw. of steam capacity. Extensive repair to one of the reservoirs is planned.

No transmission lines were added in 1945. This year it is planned to add 22.5 mi. of 110-kv. circuit on existing towers, and to construct 5.5 mi. of new 110-kv. line. All this work is in conjunction with the new South Denver Terminal substation. A small amount of reconductoring of 44-kv. lines will be undertaken. It is planned to convert the Shoshone-Palisade 44-kv. line to 69 kv.

About 105 mi. of distribution line were constructed last year, and about 125 mi. will be added this year. Probably $200,000 will be spent in rural areas.

Transformer capacity was increased 14,000 kva. during 1945. It is planned to add 36,000 kva. during 1946. The South Denver substation is expected to be three-fourths completed this year, providing 110-kv. service to added industrial load in that area.—*F. F. McCammon, vice-president.*

Southern Colorado Power

Scheduled to be ordered during 1946 and installed in 1947 are two 7,500-kw. steam generating units to be situated at Pueblo.

Budgeted for 1946 improvements to the distribution system is $224,700, a considerable increase over last year. Major items to be added under this program include the following: One 3,000-kva., 66/13.8-kv. transformer, two 300-kva. regulators, two 69-kv. circuit breakers, and four 66/2.3/4.16-kv. unit type substations with voltage regulators and circuit breakers and with specifications as follows: one of

2,000 kva. four circuits; one of 1,500 kva. with two circuits; two of 1,000 kva. with one circuit.—*M. G. Lord, vice-president.*

Trinidad Electric

We contemplate no added capacity in generation and transmission. We plan to reconductor our feeder circuits at Walsenburg, Colo., at an estimated $5,000. We also plan to double the present feeder substation size of 600 kva. at an estimated $4,000.—*Paul M. Brown, electrical superintendent.*

Idaho

Idaho Power

No hydro or steam generating capacity was added in 1945. Construction has been started on a 16,500-kw. development, units 3 and 4, at our Upper Salmon power plant on Snake River, which we plan to complete in 1946.

Thirty-eight miles of 69-kv. transmission line were added in 1945 and will function as an extension of our lines into new unserved areas. There was a limited amount of crossarm and pole replacement on 46-kv. lines in 1945. In 1946-47 it is planned to complete approximately 120 mi. of 138-kv. line to supplement the capacity of existing circuits. It is also planned to construct 35 mi. of 69-kv. transmission line to relieve overload conditions in an area now fed at 12.5 kv. A 20,000-kva. transmission substation will be built near Boise in connection with the new 138-kv. line previously mentioned.

Two hundred seventy-five miles of distribution line were added in 1945. Rebuilding and modernization were necessarily held to a minimum on account of manpower and material shortages. In 1946, it is planned to rehabilitate the distribution system in many areas. Among other features this will require raising the distribution voltage from 4.1 to 12.5 kv. Installation of 3,000 carrier current controllers for off-peaking water heat load in the Boise area will be undertaken during 1946.

Added in 1945 were 3,750 kva. in distribution transformer capacity and 11,000 kva. in static capacitors.

The continual increase in loads has made it necessary to plan considerable rearrangement of our distribution system in several areas. Plans have not been completed to date. Rather extensive use of supervisory control is contemplated.—*J. F. Emery, assistant to general superintendent.*

Boise-Anderson Ranch, USBR

Construction of Anderson Ranch Dam was continued through 1945. Work was concentrated on the dam embankment and the inlet structure. Easing of the manpower shortage toward the close of the year was reflected in greatly increased progress. Over a million yards of material were placed in the fill and it is anticipated that approximately 80,000 acre-ft., may be stored for the 1946 season. All concrete work necessary for diversion has been completed and the inlet structure is substantially finished.

Under the proposed program for 1946, work will continue on the embankment, spillway and outlet works, and the power house will be started. Installation of generators is tentatively scheduled for 1947.

Montana

Fort Peck Project, USBR

The 140-mi., 115-kv. transmission line from Fort Peck to Glendive and the Glendive substation were completed; the line was energized Dec. 1, 1945. The 20-mi., 33-kv. line from Frazer to Wolf Point was completed in February 1945. A 57- to 2.4-kv. substation and 2.6 mi. of 2,400-volt line are under construction to supply Intake pumping plant, which is also under construction.

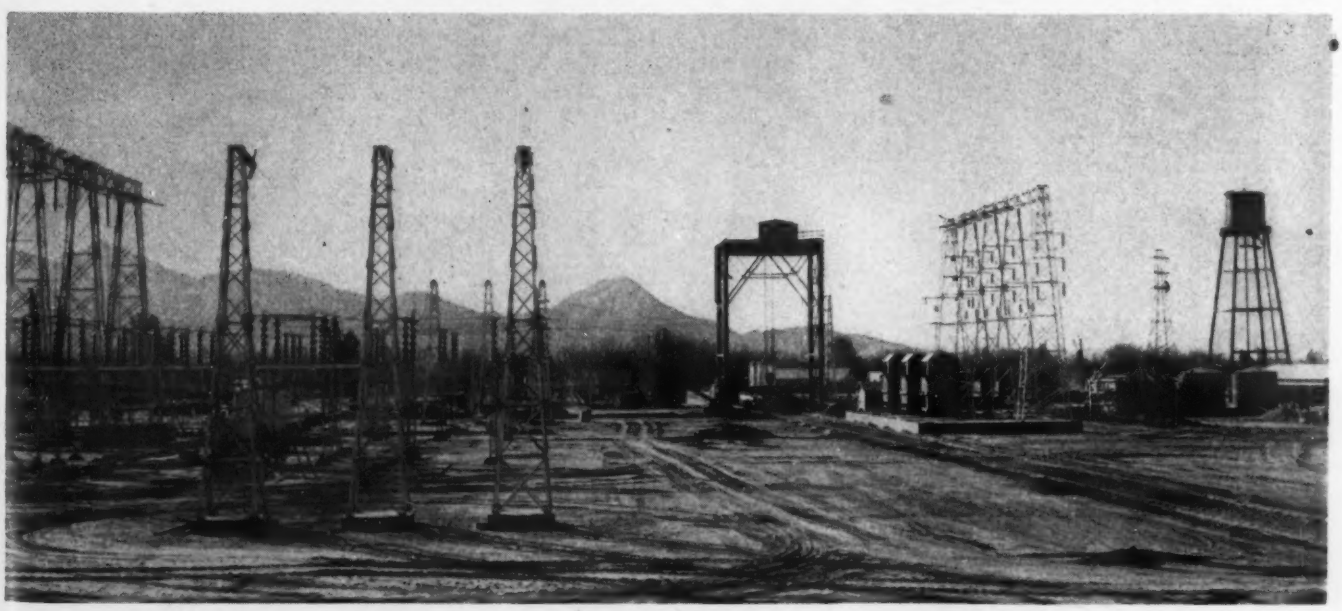
Nevada

Sierra Pacific Power

Construction activities in this company's electrical department were at a minimum in 1945. There were no additions in generation, transmission or substation, and only 13 miles of distribution lines were added.

There are no large projects planned for 1946. Seven miles of 60-kv. line will be built between Washoe hydro plant and Reno substation, with addition of one 10,000-kva., 60/23-kv. transformer bank at Reno, to supplement the supply to the 23-kv. subtransmission loop in the Reno area. Three miles of two-circuit 60-kv. line will be rebuilt. Primary feeders and mains will be reinforced in many locations to

Highgrove substation, situated on a 30-acre site between Colton and Riverside, will make 135,000 kw. of Boulder power available to So. Calif. Edison's system. It was 40% complete on Jan. 15; is scheduled for operation this year



correct substandard service resulting from increased loads not adequately provided for during the war. Two 2,000-kva. unit substations will be added in the Reno area. A few 23-kv. OCB's will be replaced and cubicle switch gear will be installed in Reno substation.

Plans are being made for complete supervisory control of three small hydro plants, but it is doubtful that the work will be done in 1946.—*V. D. Armstrong, engineer.*

New Mexico

Albuquerque G. & E.

During 1945, we installed and placed in operation a 9,000-kva. steam unit at our Albuquerque power station, raising system generating capacity to 25,800 kw.; peak loads are running around 18,000 kw.

We added 10 mi. of 44-kv. transmission during 1945, and changed over 35 mi. of 22-kv. to 44-kv. We installed a 1,000-kva., 44-kv. substation and a 500-kva., 22-kv. substation. We also installed a 9,000-kva. step-up station for the new generating unit.

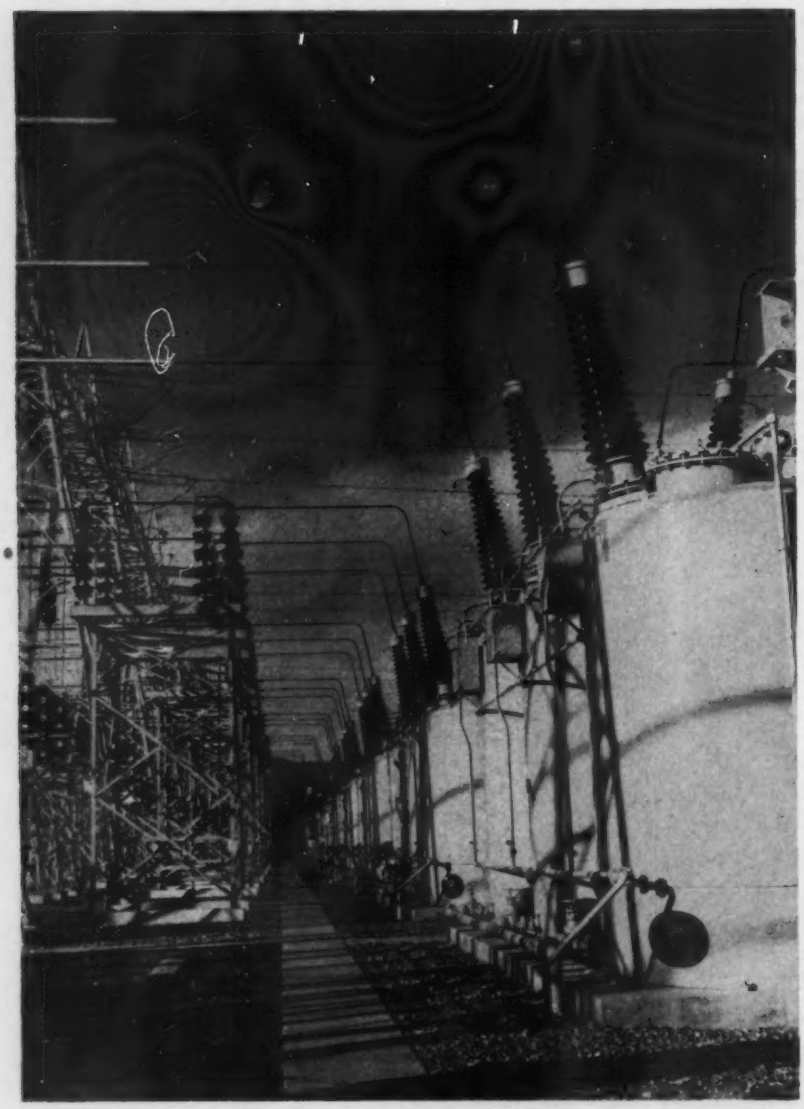
The war prevented distribution expansions to meet growing demand. We expect considerable distribution expansion during 1946. We will install one 2,000-kva., single-circuit unit substation and one 7,500-kva., four-circuit unit substation, at an estimated $100,000. We plan to cut over a number of feeders to 4,160 volts.

Oil circuit breakers in our Albuquerque plant have been installed as required throughout the last 30 years; interrupting capacity on most of them is negligible. This year we plan to replace all breakers over three years old and to install a new switchboard. At the same time we shall cut over all power house generation to 4,150 volts. These improvements will approximate $125,000.—*Arthur Prager, president.*

Rio Grande Project, USBR

During 1945, construction was started on the Las Cruces to Alamogordo 115-kv. transmission line having a length including taps of 72 mi. Of this, the section between Las Cruces and the White Sands proving ground, including the White Sands proving ground tap, comprising approximately one-third of the total length, was completed in October 1945, and the remainder is expected to be completed early in 1946.

Significance of extensive additions to Bonneville's Midway substation became known with the unveiling of the atomic bomb project. Situated near Vernita, Wash., Midway substation was an important link in supply of Columbia River power to Hanford project. Shown, 230-kv. breakers



Oregon

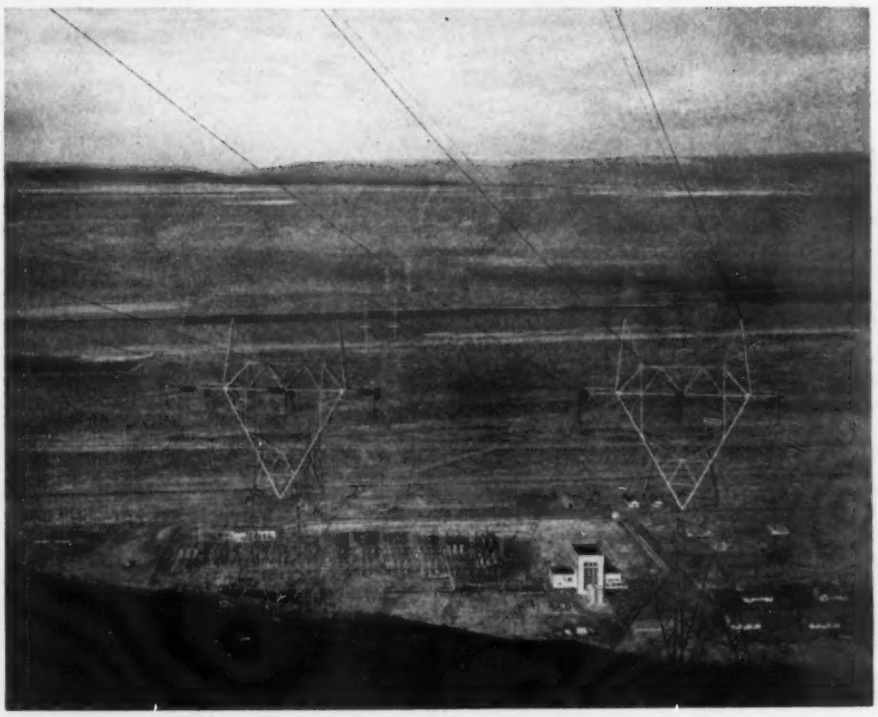
Bonneville Power Administration

With the end of World War II, lifting of the veil of secrecy which had shrouded the giant Hanford project in south central Washington revealed that tremendous quantities of power from Bonneville and Grand Coulee dams had gone into production of the bombs which obliterated Hiroshima and Nagasaki. Thus, the atomic bomb was added to the long list of Pacific Northwest war production records made possible by Columbia River power. Other Northwest contributions to the nation's war requirements included: one-third of the nation's total aluminum output, one-sixth of its magnesium production, large quantities of chemicals and alloys, thousands of B-17 and B-29 bombers, and hundreds of vitally needed cargo and naval vessels.

One primary factor in location of the Hanford atomic bomb plant in the Pacific Northwest was the existence of the 2,700-mi. Bonneville-Grand Coulee high-voltage transmission network, which made possible a maximum degree of dependability in power service.

To determine suitable methods for obtaining the highest possible degree of reliability, the Bonneville Power Administration assigned engineers to work with the staff of the Hanford Engineer Works, and made available for their work the Bonneville a-c network analyzer, the only one of its kind west of the Mississippi River.

Studies were conducted with the aid of the network analyzer to determine (a) the most reliable location on the BPA system for the important Hanford load, (b) what system circuits and connections would be necessary so that Bonneville generators could pick



From this vantage point above Midway substation can be seen (center) the two 230-kv. lines from Grand Coulee and (left) the 51-mi. 230-kv. Midway-Columbia line constructed during 1945

up and carry this load in case of trouble at the Coulee power house, and (c) how the rest of the Bonneville-Coulee system could be disconnected from the Hanford load to permit the Bonneville power house or the Coulee power house generators to continue carrying the Hanford load in case of major disturbances on the system.

As a result of these studies, the Midway substation, near Vernita, Wash., was determined to be the most reliable spot on the Bonneville system where a source of supply from two major generating stations through five 230-kv. transmission lines was available. The studies also resulted in the installation of special oil circuit breakers and control equipment at the Midway and North Bonneville substations. Among special features included at these stations was the sectionalizing of the 230-kv. buses, as well as the use of special relay settings for the control of oil circuit breakers in case of fault.

To provide added reliability of service to the Hanford load, construction activities of the Bonneville Power Administration during 1945 were directed primarily toward strengthening the central portion of the Bonneville-Coulee grid. Major projects started during the year included a large substation near Rock Island Dam on the Columbia River, and a 51-mi., 230-kv. steel tower line from Bonneville's Midway substation to the new Columbia substation, where the new line taps BPA's two 230-kv. lines from Grand Coulee to Covington, Wash. Although the line was completed by the end of the year, energization is being held up pending delivery of substation equipment.

Work also was started during 1945 on important additions to Bonneville's transmission facilities in the Longview, Wash., area. Construction was started on a new 50,000-kva. Cowlitz substation and a 3.6-mi., 115-kv. line from the Longview substation to the Cowlitz substation to serve the Cowlitz County PUD.

To meet increasing power requirements in the Longview area and to help relieve a transmission bottleneck in the lower Columbia River area, work was started during the year to convert the Longview substation from 115- to 230-kv. operation. Major addition to the substation will be a 230-kv. bank of transformers with a forced-air-cooled capacity of 100,000 kva. The substation is being made an integral part of the Bonneville-Coulee 230-kv. transmission system by construction of a double-circuit 230-kv. loop from an interconnection with BPA's Vancouver-Chehalis line to the Longview substation. The line is 7.3 mi. long.

Cost of all system additions in the Longview area will be approximately $1,600,000.

At the end of 1945 the Bonneville-Grand Coulee transmission system included 55 substations with a total rated capacity of 2,301,034 kva., and 2,730.8 mi. of high-voltage lines. More than half the total line mileage, 1,238 mi., was of 230-kv. capacity, while 1,137.6 miles was of 115-kv. capacity; the balance consisted of various lower voltages.

Projects slated for construction in the administration's 1946 program include 25 new substations with a total rated capacity of 137,500 kva., additions to existing substations aggregating 273,500 kva., and 396 mi. of new lines.

Major lines scheduled for construction under the 1946 program include a 75-mi., 230-kv. line from Arlington to Bellingham to Blaine, Wash., and a number of 115-kv. lines.—*J. R. Criswell, chief, information service center.*

California Oregon Power

In 1945, 775 kw. of internal combustion plant was the only addition to our generating capacity. In 1947, work is scheduled to get under way on 25,000 kw. of hydro capacity to be connected in 1948.

This year we will add 200 mi. of transmission, whereas last year we added only 28 mi. of 66 kv., to serve mill loads. Distribution programs for the two years are substantially the same; 75 mi. were added last year; 60 mi. are scheduled. Transformer capacity added in 1945 totaled 12,200 kva. —*J. C. Boyle, vice-president and general manager.*

Deschutes Project, USBR

Construction of the extension to the Cove power plant and the installation of the 1,500-kw. unit No. 3 and associated equipment, and the alterations to the Oromite and Redmond substations proceeded in 1945. It is expected that this equipment will be ready for operation early in 1946.

Eastern Oregon L. & P.

The end of the war returned to eastern Oregon many of its servicemen, much of its prewar mining and lumber industries and, of course, standard time. As a result, the kilowatt-hour output for 1945 exceeded that for 1944 by 15%, and the system peak increased 19%. Generation in the hydro plants was also 19% better than 1944, reflecting the benefits of the late winter snowfall.

For the year 1946, we expect a further increase in generation of about 16% and an increase in annual peak of approximately 18%. Early and heavy snow precipitation already assures a good year for the hydro plants. The hogged fuel supply for steam generation appears likely to remain as problematical for 1946 as it was in 1945.

The number of miles of rural line to be added, addition of supervisory control and communication facilities, and the rebuilding of pipelines and improvements to waterways appears to

be limited chiefly by the amount of material and the number of skilled and willing workers available in 1946.—*O. D. Lanning, chief engineer.*

Mountain States Power

Installation of a 3,000-kw. steam unit and 1,200-hp. boiler in the Tillamook plant were completed in 1945. Ten miles of 20-kv. line were converted to 66-kv. About 175 mi. of distribution line were built in the Willamette Valley and about 175 irrigation customers' installations were added.

A 115/66-kv., 26,000-kva. autotransformer and 25,000-kva., 66-kv. step regulator were added to the Springfield substation, and a 3,000-kva. bank to the Albany substation.

The 1946 budget for betterment and expansion approximates $65,000.—*G. McClellan, chief engineer.*

	1945	1946	1947
Transformers	3,400	20,975	25,000
Synchronous condensers	0	0	10,000
Static capacitors	6,700	9,700	...

All figures are in kva.

During 1947-49, distribution systems in Portland and Vancouver will be cut over to 4,100-volt Y at an estimated cost of $300,000. The fringes of Portland and small towns and rural districts in Washington will be gradually cut over to 11,000 volts.

This year's modernization program includes the following:

Albina sub., replace 11-kv. breakers	$52,000
Pittock sta., replace 2.4-kv. breakers	$30,000
Condit-Camas, revamp 5-66-kv. breakers	$29,400
System grounding and high-speed relays	$69,000

A carrier telephone dispatching circuit between Spokane and Portland will be completed this year. It will facilities, the bulk of the expenditures being for rural lines which could not be built during the war. It is probable that 1946 expenditures will be in the same order.

We are laying plans for conversion of some of our 2,300-volt systems to 4-kv. and to 12-kv. However, the bulk of this construction will not be undertaken until 1947. Our program for 1946 includes installation of approximately 20,000 kva. in substation transformer capacity to take care of load growth and modernization of certain station facilities.—*D. R. McClung, assistant general superintendent.*

Portland Dist., U.S.A. Engineers

No new generating or transmission equipment was installed during 1945. Minor power installations planned for 1946 consist principally of temporary

Current and Future Power Development on Bureau of Reclamation Projects

Name of Project	State	River	Purpose (1)	Name of Plant	Year Initial Operation	Initial kw.	Capacity Units	Ultimate kw.	Capacity Units
Boise	Idaho	So. Fork Boise	F.C., Irr., P.	Anderson Ranch	(2)	27,000(3)	2	40,500(4)	3
Boulder Canyon	Ariz.-Nev.	Colorado	F.C., Irr., P.	Boulder	1936	1,034,800(5)	15(6)	1,322,300	19(7)
Central Valley	California	Sacramento	F.C., Irr., P.	Shasta	1944	154,000(8)	4	379,000(9)	7
Central Valley	California	Sacramento	F.C., Irr., P.	Keswick	(2)	75,000(10)	3	75,000(10)	3
Colorado-Big Thompson	Colorado	Big Thompson	Irr., P.	Mary's Lake	(2)	8,100	1	8,100	1
Colorado-Big Thompson	Colorado	Big Thompson	Irr., P.	Estes Park	(2)	45,000(11)	3	45,000(11)	3
Columbia Basin	Washington	Columbia	F.C., Irr., P.	Grand Coulee	1941	818,000(5)	10(12)	1,974,000(13)	21
Davis Dam	Ariz.-Nev.	Colorado	F.C., Irr., P.	Davis	(2)	225,000(14)	5	225,000(14)	5
Deschutes (15)	Oregon	Crooked	P.	Cove	..	1,100(16)	2	2,600(17)	3
Fort Peck (18)	Montana	Missouri	F.C., Irr., N., P.	Fort Peck	1943	35,000	1	85,000	3
Shoshone	Wyoming	Shoshone	Irr., P.	Heart Mountain	..	5,000	1	5,000	1

(1) F.C. = Flood Control; Irr. = Irrigation; N. = Navigation; P = Power.
(2) Construction stopped during war. Initial operation date indefinite.
(3) 2—13,500 kw.
(4) 3—13,500 kw.
(5) As of Nov. 1, 1945.
(6) 12—82,500 kw., 1—40,000 kw., 2—2,400 kw.
(7) 15—82,500 kw., 2—40,000 kw., 2—2,400 kw.
(8) 2—75,000 kw., 2—2,000 kw.
(9) 5—75,000 kw., 2—2,000 kw.
(10) 3—25,000 kw.
(11) 3—15,000 kw.
(12) 6—108,000 kw., 2—75,000 kw., 2—10,000 kw.
(13) 18—108,000 kw., 3—10,000 kw.
(14) 5—45,000 kw.
(15) Cove power plant owned and operated by Pacific Power and Light Co. Bureau of Reclamation installing 1,500 kw. unit (No. 3).
(16) 1—700 kw., 1—400 kw.
(17) 1—700 kw., 1—400 kw., 1—1,500 kw.
(18) Fort Peck power plant operated by United States Army Engineers. Power distributed by Bureau of Reclamation.
(19) 2—35,000 kw., 1—15,000 kw.

Northwestern Electric

No additional generating capacity was added in 1945, and none is contemplated for 1946. One additional boiler probably will be added at our Lincoln station in 1947.

No new transmission lines were built in 1945. During 1946, 15 mi. of 110-kv. (operated at 66-kv.) line probably will be built between Bonneville's Troutdale substation and our Albina substation in Portland. The conductor will be 500,000-cir. mil copper carried on wood poles of H-frame construction through all private right of way, and of wishbone construction through city streets. This line will be the main feed from the Bonneville system into ours. Estimated cost: $501,700.

Last year 14 mi. of distribution lines were added; 22 mi. are contemplated for this year. Accomplished and scheduled additions to transformer and condenser capacity are:

operate over Northwestern's 66-kv. line from Portland to Condit plant, Wash., over Pacific Power & Light Co.'s 110-kv. line from Condit plant to Pasco Wash., and over Washington Water Power Co.'s 110-kv. line from Pasco to Spokane. Supervisory control for Stark and Cully substations will be installed in 1947 at an estimated cost of $3,500.

House heating and prospective industrial loads are causing us to raise our sights on load forecasts for 1946-47-48.—*O. L. LeFever, general superintendent.*

Pacific Power & Light

No new transmission lines were constructed in 1945. Our present program for 1946 contemplates construction of 35 mi. of 22-kv. lines to replace existing facilities.

Approximately $700,000 was spent for construction of new distribution facilities to construction camps at Dorena and Detroit dams—*Horace H. Person, Maj., executive officer.*

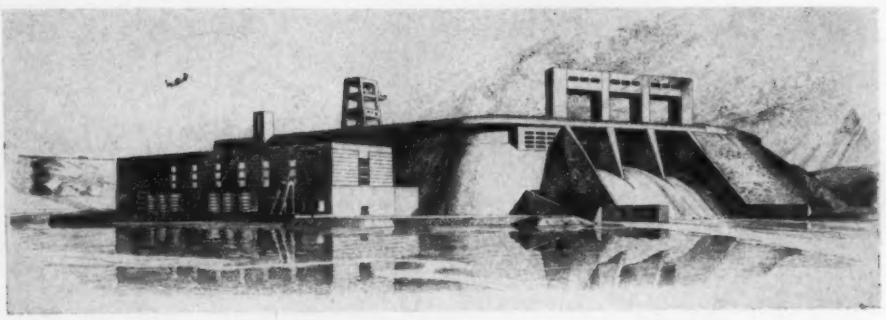
Portland General Electric

We anticipate construction expenditures for 1946 totaling about $3,000,000.

The only large item pertaining to generation is the plan to rebuild about three miles of Bull Run flume, using treated lumber, at an estimated $775,000—half the job being scheduled for this year, the other half in 1947.

Portions of the 57-kv. line between The Oaks crossing and Rex are scheduled to be rebuilt; total distance, approximately 18 mi. Six miles of 57-kv. rebuilding is scheduled between Bluff Road and Boring.

We have an extensive program for modernizing our 57-kv. bus and switch structures. New high-capacity oil circuit breakers have been purchased for



Like many utilities, USBR is dusting off designs which were laid away throughout the war. This one is of Davis power plant on the Colorado River. Bids were received on Dec. 21, 1945 for work scheduled to begin early this year

the points of high power concentration and the smaller breakers which will be released from these points will be moved to locations where the short-circuit requirements are less severe.

The distribution program calls for reinforcing the urban distribution with unit substations stepping directly from 57 to 4.15 kv., cutting suburban feeders from 2.4 to 4.15 kv. and cutting rural distribution to 12.5 kv. About 220 mi. of new line will be added for customers' extensions.

Installation of 100,000 kva. in new substation transformer capacity is expected during 1946-47. Emergency equipment includes a 2,500-kva. portable substation which can be used for serving 2,400-, 4,150-, 7,200-, or 12,500-volt distribution from 57 kv., and a 1,500-kva. unit for serving the above from 11 or 22 kv.

We have added a large number of static capacitors during the past few years but do not expect to add many during 1946-47.

Distribution changes during 1946-47 will be of a major character. We will use single transformation where feasible for supplying distribution and will go to higher distribution voltages.

A number of supervisory-control installations are planned.—*John Bankus, chief engineer.*

Utah

Telluride Power

In 1945 we spent about $125,000 for additions and improvements; expenditures in 1946 probably will be about $75,000.

We built 28 mi. of 44-kv. line in 1945, most of it to duplicate our line into the important Milford railroad and metal mining center. No 44-kv. extensions are in sight for 1946, but reconductoring of 12 mi. is planned.

During 1945 we added about 20 mi. of rural distribution lines and contemplate about the same for 1946. We shall add 1,500-kva. in substation capacity this year and install six 44-kv. oil circuit breakers.

In the spring of 1945 a splendid, ornamental white-way street-lighting system was installed in Delta. On April 1, reduced power-rate schedules went into effect, and on Nov. 1, a new combination residential rate with water heating features was offered. The Topaz Japanese Relocation Center closed in November, resulting in a substantial reduction of our load; the future use and disposition of the project are not yet known.—*Paul P. Ashworth, general manager.*

Utah Power & Light

No additions to generating capacity were made in 1945; the 1946-47 program is confined to two small internal-combustion installations: 100 kw. at Moab and 300 kw. at Vernal, both in Utah.

Transmission additions amounted to 2.6-mi. of 44-kv. line; about 76 mi. of 44-kv. line are scheduled to be added. Although a great deal of contemplated distribution construction was necessarily carried over, 225 mi. were added during 1945. Including the carry over, rural extensions amounting to 500 mi. are scheduled for 1946, if men and materials are available, $556,700 being budgeted for this item.

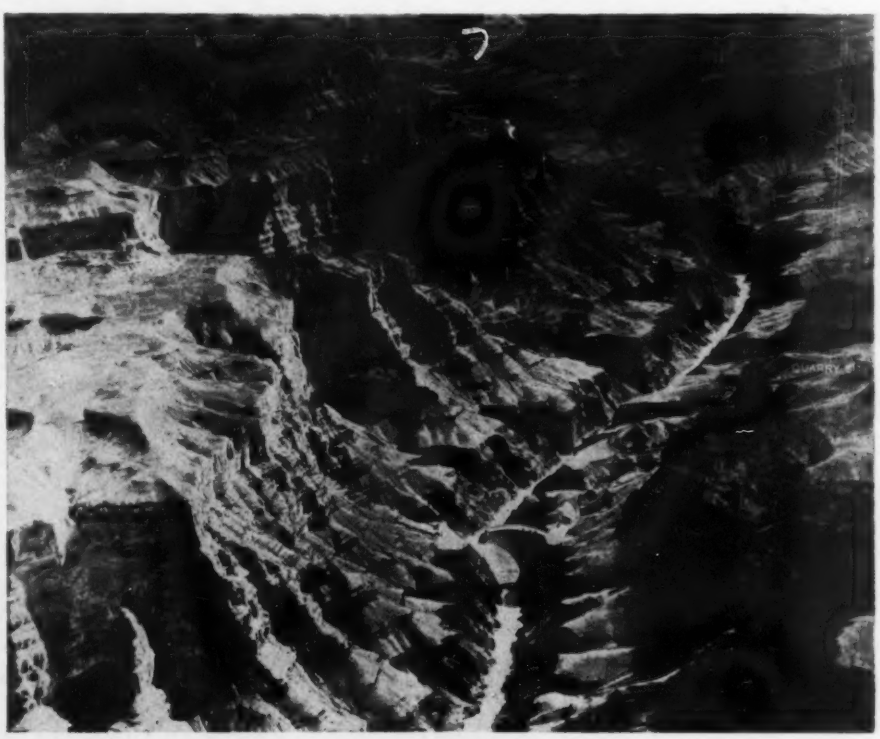
Net additions to the Utah company's substation capacity totaled 4,000 kva. in 1945, while 3,300 kva. customer-owned substations were connected to the 44-kv. transmission system. Including the rural extension figure mentioned above, $940,500 is contained in the 1946 budget for distribution betterments.

This year five 44-kv. and two 132-kv. oil circuit breakers are scheduled to be replaced by modern high-speed breakers. Present plans provide for the installation of supervisory control in three locations. In general, availability of materials and labor continues to be the controlling factor.—*T. A. Purton, chief engineer.*

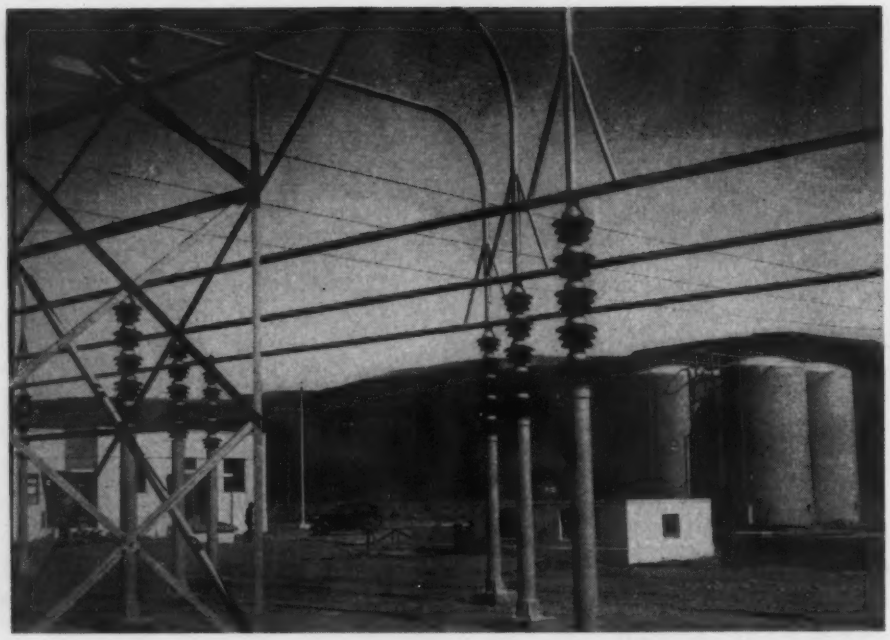
Washington

Columbia Basin, USBR

Turbines, generators, and associated equipment for three 108,000-kva. generating units, for positions L-7, L-8, and L-9 in the Grand Coulee power plant, are under contract, and delivery of the equipment is expected to start



USBR's Bridge Canyon Dam site on the Colorado River. Dam is sketched in



Bonneville's new Columbia substation, near Rock Island Dam, built in 1945

in the latter part of 1946. These will replace the two 75,000-kva. Shasta units which operated in the L-7 and L-8 positions during the war. Dismantling of the L-8 Shasta unit started in November 1945. The two Shasta units will be removed to the Shasta power plant of the Central Valley Project for installation there. General work in connection with the Grand Coulee Dam continued through 1945. Work also went forward in connection with spillway repairs which included the installation of eight needle valves in the Right power house, and the construction of a drydock and a floating caisson. All these are well advanced and expected to be completed in 1946, when actual spillway repairs will be started. Surveys and designs for irrigation features are in progress, but no irrigation construction has started.

Puget Sound P. & L.

During 1945 this company spent $3,250,000 for construction; the figure estimated for 1946 is $3,800,000.

No new generating capacity was added or is contemplated, but minor replacements and improvements are as follows: In 1945, $6,000 for steam and $12,000 for hydro; estimated for 1946, $12,500 for steam and $45,000 for hydro.

Transmission improvements accounted for $350,000 in 1945, are estimated at $660,000 for 1946. Work was started on 35 mi. of new line which, with terminal facilities, will cost about $345,000. About three-fourths completed at year's end, the project will be finished early this year. About 15 mi. of transmission was rebuilt and reinsulated in 1945. Twenty-two miles of line are planned for construction this year at a cost, including terminal facilities, of $400,000. Twenty miles of transmission are scheduled to be rebuilt and reinsulated.

Distribution additions aggregated about 140 mi. last year, are expected to amount to 270 mi. in 1946. Distribution plant expenditures in 1946 approximated $2,800,000, are estimated at $3,000,000 for 1946. These figures include extensions and additions to lines, including services, transformers and meters, and new substations and equipment.

Six new distribution substations built in 1945 have a total capacity of 13,600 kva., and 30,000 kva. were added to 24 existing stations. Planned for 1946 are one transmission substation of 6,000 kva. and six distribution substations of 13,500 kva. In addition, 13 distribution substations will be enlarged by 12,000 kva. total. Approximately 40,000 kva. of distribution transformers and 1,260 kva. of static capacitors were added in 1945; the 1946 schedule is similar.

During 1945, 13 oil circuit breakers were modernized at a cost of $47,000; to be modernized in 1946: eight, at $30,700.

Although no extension of supervisory control is scheduled, about $5,000 will be spent to complete installations now being made.

A new service building, estimated at $54,500, will be constructed this year in Bremerton. Two line headquarters buildings, started last year and estimated to cost $57,500, will be completed in 1946.—*Frank McLaughlin, president.*

Seattle City Light

No generating capacity was added during the past year and no additions are planned for 1946. Construction of the second step of Ross Dam has been more rapid since September as labor is more plentiful. This project will provide storage sufficient to double the firm capability of the present Diablo and Gorge plants during the most critical stream-flow conditions. Practically all rock excavations including the driving of two 27-ft. power tunnels has been completed, and the contractor is

La Grande Dam, one of two in Tacoma City Light's Second Nisqually project. Adding 90,000 kw. to the system, the project is scheduled for completion in 1946. 65,000 kw. are already in service

placing concrete on the main sections of the dam. The completion date is now estimated as October 1947.

No additions were made to the high-voltage transmission system during 1945. It is planned to start the addition of 9 mi. of 220-kv. steel tower line and 15 mi. of 165-kv. wood-pole H-frame line in 1946. About 8 mi. of 26-kv. inter-substation tie lines were completed in 1945, and 17 mi. more will be added in 1946.

A third bank of 220/26-kv. transformers of 60,000-kva. capacity was placed in service in May 1945, at the South Receiving substation. Additional transformers of 13,500 kva. were placed in service in existing substations. The new Central substation for serving the underground distribution system will be placed in service in 1946. This station will have 18,000-kva. capacity with eight 4,300-volt underground feeders and 4,500-kw. rectifier capacity for supplying 600-volt d-c to the Seattle municipal transit system. Installation of 30,000 kva. of 4,330-volt primary network substations will be completed in 1946. It is also planned to order a 20,000-kva., 220/26-kv. transformer as a spare for the South Receiving substation.

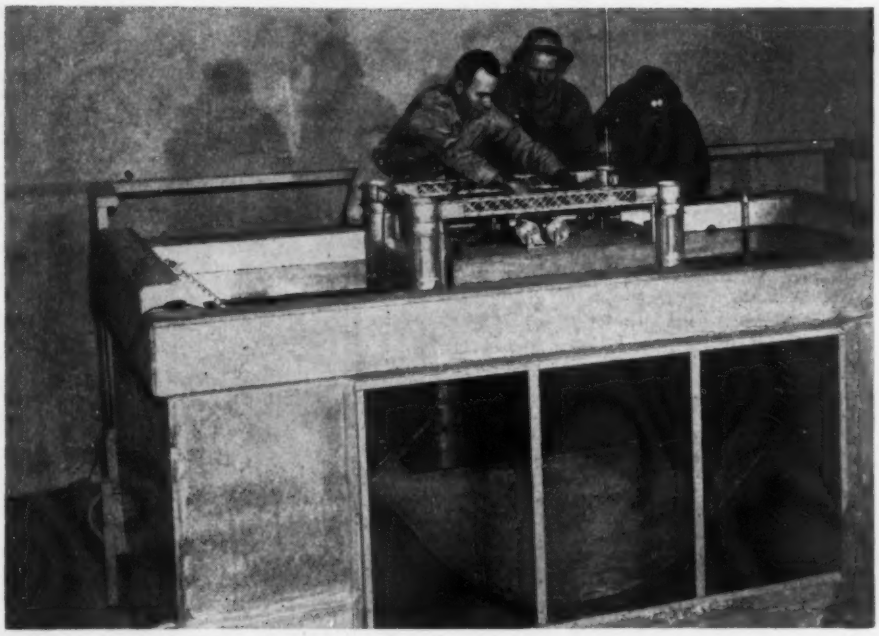
Maintenance was below normal during 1945 because of shortage of materials, but it is believed that this type of work will be increased considerably in 1946—*E. R. Hoffman, supt.*

Tacoma City Light

Initial output, aggregating 65,000 kw., was received in 1945 from the second Nisqually power development, consisting of two dams, now nearing completion; capacity will be 90,000 kw., increasing the city's generating capacity to 238,000 kw., composed of 204,000 kw. of hydro, the balance being steam, normally held as cold-steam standby. (Additional capacity is available through interconnections).

Nominal increases took place during 1945 in transmission and distribution line mileage. Three 3,000-kva. residential unit substations were installed and 3,000 kva. of transformer capacity added to existing substations. A comprehensive system of telemetering and load control equipment was installed and is now being adjusted. In connection with this installation, a new dispatching office incorporating a new system-diagram board was occupied in late 1945.

Despite loss in war loads and loss arising from strikes, 1945 showed a 6% increase in gross energy and a 2.6% increase in peak over 1944. Energy generated and received amounted to 863,257,000 kwh.; peak was 157,000 kw. Gross revenue was approximately $5,100,000, an 11% increase over 1944.—*A. F. Darland, superintendent.*



Grand Coulee spillways are scheduled for repair this year. Work will get under way behind caissons, design of which was perfected by tests with this model

Washington Water Power

A construction budget in excess of $1,500,000 is contemplated for 1946, compared with $1,000,000 for 1945. Actual 1945 construction did not, however, come up to anticipated levels, because of wartime shortages, and some of the work planned for that year will be completed in 1946.

Completed during 1945 was the rebuilding and modernization of 72 blocks of the Spokane distribution system, lines being moved from streets to alleys, and three underground vaults being changed from 4,000 to 13,000 volts.

Fifty-eight blocks of distribution lines in Coeur d'Alene, Idaho, were replaced, likewise, changing operation from 4,000 to 13,000 volts. A 1,000-kva. substation to serve the Rathdrum Irrigation District was completed, and a half mile of 13,000-volt line was built to connect it with the system.

A 25,000-kva., 110/33-kv. substation was built at Ross Park in Spokane, and a site was purchased and engineering work begun on the East Side substation, which will be of 50,000 kva. at 110/60/13 kv. This station will be completed as materials become available.

Three substations were built to serve mining interests in the Coeur d'Alene region. These included a 1,000-kva. station for the Denver Development Co. and 666-kva. stations for the Nabob and Sidney mines. All will operate at 13/2.3 kv.

Modernization of all street lighting systems throughout the territory will be the primary construction feature of 1946. Brought about by a revision of street lighting rates, the modernization program is expected to bring an increase of 50% in the number of lights in use.

In addition to the East Side substation, we plan to rebuild the Downriver area in Spokane to accommodate 13,000-volt Y/G operation, and the same program will be carried out in the Altamont district. The 13,000-volt Spokane underground feeder planned for 1945 will be built in 1946, and seven additional vaults will be changed from 4,000 to 13,000 volts.

Feeders in eight communities will be rebuilt for 13,000 volts. More than 300 mi. of rural extensions will be made, and 150 mi. of customer-owned lines are scheduled for purchase.

Transmission construction will include rebuilding 15 mi. of the Pend Oreille line, now operated at 60 kv., to a two-pole, H-type structure spaced for 110 kv. High-speed, impedance type relays for three-phase and phase-to-phase fault protection, and directional high-speed protection for phase-to-ground faults will be installed at Bunker Hill and Sullivan, Burke, Government Gulch, and Latah Junction substations. We also contemplate replacing the present low-speed, current-balance relays on the Long Lake-East Side lines, at Long Lake, with modern, high-speed equipment.

As before, actual fulfillment of these plans is dependent on availability of materials. Emphasis will be placed, as always, on the improvement and maintenance of service.—*J. E. E. Royer, vice-president, general manager.*

What a Market—! If, As and When There's Selling

IF America can get over its strike hangover from war, and if it still has anything left in its pocket after the binge, there's a bright day ahead.

For never in history has there been such a pent-up need for replacement of electrical equipment or such a market for the equipping of the 100,000 or more new homes needed to house the increased Western population.

Where everybody comes from is a mystery. That they are here is a fact. That they need 125,000 electric ranges, 65,000 water heaters, 2,875,000 refrigerators and are willing to buy 83,000 home freezers as well as comparable quantities of other appliances and lighting equipment is also established by surveys and intelligent estimates.

And there are 12,800 or more dealers now, whereas there were only 7,500 in 1941, ready, eager, in fact crazy to sell them, if they can only get their hands on some merchandise to sell.

Manufacturers too would be ready if the hangover was done and men and women went back to work. They have reconverted plant facilities, have designed new models, prepared sales plans and advertising materials, established prices and policies, set up distribution—on paper. Distributors have show rooms ready, warehouses cleared to receive new wares, organizations ready to sell and serve.

But overhead will eat them up, as it will the dealers, and just as savings and war bonds will be consumed too by those stopped from working by the strike epidemic, if America sleeps it off much longer. There will be nothing to pay *any* wages with if something is not *produced* and *sold* soon.

The Western market for all electrical goods and services is at an all-time high. The utilities report 66,000 more residential customers in the eleven Western states than last year. If they could get individual homes built the now doubled-up population would spread to increase the number of meters to exceed these figures. There are 20,000 additional commercial and industrial customers over last year, each in the market for lighting and electrical facilities.

Habit of using lots of electricity in the West is proved by average annual kwh. consumption figures. Two utilities now top 4,000, four exceed 3,000, eight have over 2,000 and all but four of the 40 reporting exceed 1,000. Commercial usage is up also for most companies, as the tables show. Saturations are high, which means an excellent replacement market.

Fewer utilities will do much if any merchandising themselves. Yet all of them plan aggressive dealer assistance programs of advertising, sales training and other helps.

A big breakfast is all ready on the table, the pot is boiling on the stove. If America will shake the sleep from its eyes, there's a fine day ahead.

Arizona

Central Arizona Light & Power

As reported in a recent issue of ELECTRICAL WEST, the Central Arizona Light & Power Co. recently held a big dealers' meeting at which opinions were asked of the dealers in regard to details for the improvement of its well-established dealer cooperative programs. At that time it was emphasized that the utility would develop the market, conduct surveys, and develop prospects, and promote various campaigns in which dealers would handle the merchandise.

Because of present rapid growth in the territory, saturations are not yet determined, but it is to arrive at such information that the company's efforts will be directed. The market, however, for new appliances was determined in a survey recently conducted among its customers. In this it was determined that, in addition to the figures given in the accompanying table for ranges, refrigerators, etc., 100 air-conditioning systems of the refrigerated type and some 2,000 evaporative coolers could be sold in 1946, provided the merchandise is available.

Tucson G. E. L. & P.

No decision has been reached whether to merchandise or not by the Tucson Gas, Electric Light & Power

Dealer meetings again! This was that of the Southern California Radio and Appliance Assn.

Co. The program evidently was still being developed and was not yet ready for announcement.

California

Anaheim Dept.

The City of Anaheim, Calif., has no program of dealer cooperation nor is there a dealer cooperative organization in town. As a strictly electric service agency, it has no figures as to appliance saturation or estimates of possible sales.

Alameda Bureau

Sharing in dealers' newspaper advertising and offering a range wiring allowance of $40 per range in the wiring of a home, the Bureau of Electricity, city of Alameda, plans to work with dealers in the development of load. In promotion of lighting, commercial cooking, air heating, air conditioning, evaporative cooling and new appliances, it also will work with dealers only.

Figures in the report in the accompanying tables for residential customers includes single-family dwellings only and not apartment houses or master metered apartments. The commercial customers relate to those having commercial lighting and not power.

California Electric Power

While California Electric Power Co. plans to sell merchandise direct and thus will be competitive with dealers, its program of dealer cooperation provides for special activities in which dealers will have the same privileges and opportunities to participate as the company. Included in the list of items which the company will merchandise are ranges, water heaters, refrigerators, home freezers, both automatic and conventional washers, ironers, radio sets, vacuum cleaners, small appliances, mechanical air conditioners, evaporative room coolers, auxiliary air heaters, commercial cooking equipment, beverage coolers, reach-in refrigerators, water coolers, broilers, etc. In the accompanying tables the figures for appliances other than those listed include an estimate of ten refrigerated air-conditioning systems, 350 evaporative cooler systems, 25 attic ventilation jobs, and ten clothes driers.

"The strike situation has, of necessity, set our plans back," said W. S. Fleming, sales manager, "just when we will get into full stride is hard to tell. We had just started hiring and training salesmen when we were advised of the possibility of this electrical strike so a couple of weeks ago we even discontinued that. According to a very hasty survey it looks like we are going to have more appliance dealers in our territory than ever before and I presume this is universal."

The company will have three girls who will call on all complaints of unsatisfactory performance and demonstrate all new ranges, refrigerators and laundry equipment as soon as possible after they are delivered.

For its commercial program, the company will have one full-time man on industrial, another on domestic and another on commercial, and will expand this force if necessary. A full-time salesman will promote commercial cooking, air heating and air conditioning.

Merchandise displays will be shown at the National Orange Show and at county fairs, and extensive newspaper and radio advertising will be carried. Special appliance campaigns will be conducted, with dealer participation.

Glendale P. S. Dept.

Although the city of Glendale Public Service Department had not definitely decided whether it would merchandise any appliances, there seemed to be no immediate prospect of it doing so. It plans to do some advertising in radio, newspapers and by direct mail, and will support some types of dealer cooperative organizations. It is a participant in the Southern California Radio & Electrical Appliance Assn., along with other municipal utilities of the area.

In addition to the figures given as to numbers of customers, while the department serves no rural area, it segregates its commercial light and commercial power. The figures in the table indicate the commercial lighting customers. There were also 1,473 commercial power customers as of Dec. 31, 1944 and about 1,570 as of Dec. 31, 1945, with an average kilowatt-hour consumption per customer of 12,750, a slight reduction from the 1944 average of 13,300.

Los Angeles Dept. of W. & P.

Programs and activities to assist the retailer directly in the promotion and sales of electrical appliances, particularly electric ranges and water heaters, will be conducted by the Business Agent's Division of the Department of Water & Power, City of Los Angeles. As examples of these programs are the following: Individual assistance through dealer contact representative to aid dealers in making sales; store planning and modernization layouts offered free to dealers; development and distribution of major appliance prospects; assistance in the installation of demonstration kitchens in dealers' stores; sales training programs for dealers and dealer salesmen; general department appliance advertising in all media; cooperative advertising assistance to dealers; a continuance of the major appliance wiring-reimbursement policy and merchandise displays on the department's various office display floors.

The department, likewise, gives full support to the Southen California Radio & Electrical Appliance Assn. in its efforts to develop business for the dealers of the area.

Home service activities will include calls on new range users to instruct them in the use of their equipment. Regular weekly cooking and nutrition classes will be held. Demonstrations and instructional classes will be conducted among club groups. Cooking schools will be held in department stores and cooking and nutrition programs in the public schools, for teachers and students and similar programs will be conducted for parent-teacher association groups.

The home service staff will assist in the schools for dealer salesmen and will hold demonstrations in dealer stores at their request. The home economists will give laundry demonstrations for large classes and will conduct meetings at their headquarters, "The Matchless Electric Home," on Wilshire Blvd., treating on current subjects in home economics.

For the first time a lighting promotion progam for home lighting will be carried on. Two women home planning advisors will call on consumers who are planning to build or remodel their homes, furnishing them with suggestions on kitchen planning, adequate wiring and residential lighting. This is a separate function from the home service unit.

In the commercial field, extensive and aggressive promotion of air conditioning, illumination and commercial cooking is planned for the year 1946. New commercial construction and remodeling of existing buildings is being held up pending release of building

materials. The extent of promotional work will be dependent upon the availability of electric equipment.

Modesto Irrigation District

Field men will be available to assist dealers in contacts with the public and to furnish dealers with leads for sales, according to the program of the Modesto Irrigation District, which will do no direct selling of merchandise itself.

In addition to the estimates on appliances, it is felt that at least five refrigerated air-conditioning jobs, 400 evaporative coolers and 100 attic-ventilation jobs can be sold in 1946 in this territory.

Pacific Gas and Electric

"Although the immediate 1946 business outlook for a segment of the electrical industry—specialized wholesalers and retailers—in northern California is probably as dismal as any it has faced during the war," declares O. R. Doerr, general sales manager, Pacific Gas and Electric Co., "the long range picture is anything but pessimistic. The delay in providing appliances and equipment for a hungry market is due to many forces which together have slowed up or, as at present, completely stopped production. Margin reductions, building bottlenecks and the mushroom expansion of retail outlets are further factors which have contributed to this unfavorable position.

"Perhaps this negative note might be dispelled by a knowledge of the facts of the tremendous pent up demand in northern California for the products merchandised by these two branches of our distributing system. Certainly the figures are impressive and promising. It is not likely, however, as circumstances are shaping up, that either retailing or wholesaling in the electrical field is going to be at any time 'just a grand sleigh ride.'

"For what they are worth, here are the figures representing the dollar volume totals of the immediate market demand (defined as that which could be sold in a three-year period if products were available) for the twelve major electric appliance merchandise items and for wiring in existing homes. This demand most certainly will be satisfied sooner or later, depending upon how fast the manufacturers are able to produce the merchandise.

Electric Appliances	*Retail $ value
Refrigerators	$ 39,200,000
Washing machines	20,000,000
Home freezers	6,600,000
Radios	31,700,000
Vacuum cleaners	12,700,000
Ranges	7,100,000
Dishwashers	6,500,000
Ironing machines	7,400,000
Air conditioners (comp.)	1,900,000
Air conditioners (evap.)	1,900,000
Home laundry dryers	2,500,000
Water heaters	1,600,000
Total	$139,100,000
Adequate home wiring installations	$ 4,900,000
	$144,000,000

* 1941 average unit values used.

"Spreading this potential over three to four years represents a volume for individual appliances of from two to several times prewar sales. The knowledge of such a large backlog of

Customers and Consumption

UTILITY TERRITORY	Average Annual kwh. Consumption — Residential 1945	1944	1943	1942	1941	Commercial 1945	1944	Residential Customers 1945	1944	Farm Customers 1945	1944	Commercial Customers 1945	1944
Alameda Bureau of Elec.	1,416	1,344	1,256	1,201	1,044	5,076	4,680	12,400	12,399	...	...	1,156	1,119
Anaheim L. P. & W. Dept.	750	700	...	...	...	1,000	900	3,465	3,450	...	...	880	877
B. C. Electric Ry., Vancouver.	1,100	1,089	1,025	932	926	5,160	5,083	92,872	87,804	22,609	18,896	17,574	16,056
B. C. Electric Ry., Victoria	1,218	1,062	952	869	850	5,720	4,600	19,989	19,800	4,844	4,500	3,639	3,500
Calif. Elec. Power	...	1,300	1,259**	1,328	1,314	...	...	27,500	25,302	3,500*	3,200	5,050	4,679
Calif. Oregon Power	2,886	3,024	2,909	2,706	2,558	5,667	5,463	38,400†	33,639†	...	3,441	8,500	6,883
Central Ariz. L. & P.	1,452	1,324	1,070	1,140	1,088	12,461	12,034	35,850†	33,610†	...	1,200	5,691	5,264
Coast Counties G. & E.	...	943	871	...	...	...	...	...	11,482	...	12,362	...	4,066
Colorado Springs P. U. Dept.	1,190	1,142	1,002	...	...	5,000	4,980	13,900	13,498	...	...	3,150	3,036
Eastern Ore. L. & P.	1,664	1,494	1,413	1,305	1,167	...	...	6,072	5,886	988	943	1,095	1,088
El Paso Elec.	...	...	1,315	1,259	1,285	...	...	...	...	...	...	...	...
Eugene Water Bd.	3,500	3,424	3,269	2,993	2,752	10,000	9,670	10,575	10,057	...	...	1,440	1,373
Glendale P. S. Dept.	1,320	1,291	1,162	1,084	1,112	6,500	6,267	27,560	27,306	...	...	3,750	3,677
Hawaiian Elec.	1,791	1,647	1,567	1,389	1,411	...	...	47,299	46,213	...	...	10,300	10,276
Idaho Power	2,550	2,457	2,361	2,137	2,018	6,430	5,984	48,000	45,976	21,000	19,811	11,200	11,002
Imperial Irrig. Dist.	...	2,078	2,078	...	...	...	...	...	10,866	...	5,823	...	2,475
Logan, City of	2,334	2,258	...	...	...	...	...	3,219	3,156	...	...	416	412
Los Angeles Dept. W. & P.	1,220	1,135	1,023	977	998	11,130	10,605	470,500	462,602	...	...	90,700	86,766
Modesto Irrig. Dist.	2,250	2,148	2,000	...	...	23,000	20,270	5,264	5,064	6,426	6,126	2,350	2,273
Montana Power	1,165	1,117	1,081	...	...	7,200	5,518	75,672†	75,094†	...	3,115	12,350	13,411
Mountain States Power	1,875	1,763	1,684	1,534	1,410	3,650	3,471	50,500	48,560	10,000	8,931	9,100	8,658
New Mexico Power	...	720	600	...	...	...	...	...	4,100	...	300	...	552
Northwestern Elec.	3,210	2,950	2,734	2,180	1,720	12,438	11,958	43,195†	42,459†	...	...	7,030	6,747
Pacific Gas & Elec.	1,345	1,227	1,137	1,068	1,063	10,358	9,450	852,215	830,733	42,928‡	40,728‡	148,036	139,685
Pacific P. & L.	2,150	1,978	1,895	1,765	1,802	7,375	6,860	57,000	55,300	19,500	18,800	13,000	12,700
Pasadena L. & P. Dept.	1,280	1,241	1,080	1,050	1,027	18,750	17,920	29,382	29,232	...	...	3,410	3,330
Portland Gen. Elec.	2,633	2,373	2,218	1,935	1,698	...	...	145,612†	142,061†	56,600	50,672	16,550*	15,670*
Provo, City of	...	1,368	1,374	...	...	...	...	...	5,218	...	...	...	...
Public Service of Colo.	975	906	857	781	781	6,778	7,803	121,391	119,362	6,312	5,447	19,000	18,113
Puget Sound P. & L.	2,685	2,389	2,262	1,997	1,716	16,500	15,222	224,000†	216,132†	...	...	25,000	23,827
Raton Public Service	1,038	...	...	...	...	3,761	...	1,686	...	...	...	503	...
Riverside L. Dept.	1,260	1,200	...	...	...	6,360	6,108	11,500	11,405	...	...	1,385	1,360
San Diego G. & E.	1,320	1,246	1,135	1,074	1,135	9,725	8,895	110,500†	109,007†	...	18,390	17,500	16,342
Seattle City Light	3,556	3,246	2,993	2,612	2,062	8,983	8,547	89,850	89,085	...	...	11,900	11,402
Sheridan County Elec.	851	824	803	...	748	...	...	2,710†	3,587†	...	425	850	618
Sierra Pacific Power	2,257	2,066	1,856	1,738	1,682	17,800	16,378	14,503	12,248	1,600	1,500	2,456	2,325
So. Calif. Edison	1,216	1,146	1,070	983	1,005	4,920	4,488	515,935	499,147	25,623	25,511	65,363	61,467
So. Colorado Power	1,148	1,124	1,047	991	975	7,204	7,370	23,509	24,349†	1,903	1,760	3,173	3,105
So. Nevada Power	4,580	4,534	...	...	...	13,180	12,720	5,962	5,560	...	...	1,410	1,358
Tacoma, City of	4,178	3,640	3,402	2,852	2,435	...	...	39,991	39,225	...	...	4,312	4,115
Telluride Power	850	800	800	...	...	...	...	4,600	4,408	825	805	675	603
Trinidad El. Tr. Ry. & G.	...	...	661	638	...	...	...	...	...	...	...	...	...
Tuscon G. E. L. & P.	1,275	1,711	1,137	...	1,014	6,000	5,675	10,350	9,914	8,950	8,152	2,200	1,953
Uintah P. & L.	925	875	752	800	...	2,300	2,162	700	650	200	150	370	320
Utah P. & L.	1,559	1,386	1,328	1,243	1,246	8,182	6,599	122,224†	119,283†	...	...	12,386	12,028
Vallejo E. L. & P.	...	...	1,048	1,024	...	...	...	...	...	...	...	...	...
Washington Water Power	3,168	2,661	2,708	2,369	2,348	11,852	10,430	68,561‡	66,838‡	12,869‡	11,245‡	11,443‡*	10,901‡

* Includes Industrial. † Includes farm customers. ** Excludes Imperial and Coachella Valley systems to Imperial Irrigation Dist., Oct. 15, 1943.
‡ See accompanying report for explanation and interpretation.

future business should assuage to a degree the 'gloom' which present conditions might create.

"Turning from domestic electric appliances, there are many other fields which offer boom-time possibilities. I have in mind particularly the commercial and agricultural classifications. In these categories involving businesses which certainly must be classed as essentials, the greatly expanded and now crystalized population increase supports a most optimistic viewpoint.

"Stores, shops, gasoline stations, and almost every kind of retail establishment is eager to secure, is in dire need of, and is financially able to buy equipment of all kinds. Moreover these business people recognize their need and, for the most part, are determined to do something about it. Production possibilities, furthermore, seem brighter in the types of appliances required to satisfy these markets.

"In agriculture the demands for food are expected to hold crop production in northern California near the 1945 all-time high of one billion dollars. After several good agricultural years with wartime restrictions on durable goods, farmers have a myriad of needs, bulging pocketbooks, and a receptive mood for anything which smacks of comfort, convenience, entertainment, and the saving of labor. Nothing more as an ingredient to good business is needed with prospects in this condition except merchandise to satisfy the desires, and the organization and sales machinery to bring such merchandise to these ready prospects.

"Even in heavy industry where contraction from inflated war production to normal peacetime operation has been felt, especially with those firms which worked on shipbuilding, a fairly optimistic outlook is present. The record of 1945 indicates a decidedly forward trend in the small industrial field, with a further expansion in facilities for many industries large and small.

"In example, during 1945 northern California projects representing considerably more than 100 million dollars were launched. This increase in plant facilities is represented by expansions in old plants as well as new industries totaling several hundred. Furthermore, there is a backlog of many prospects for additional plant facilities in this area. The industrial development program of our company, plus the efforts of all agencies interested in consolidating wartime gains in northern California, has contributed to this showing.

"All of the above facts, together with the rather intangible and formidable force represented in a greatly accelerated business tempo in the western region of these United States, presages for some few years at least, discounting certain areas of difficulty as mentioned above, a generally optimistic viewpoint. This doesn't mean we will not have unemployment and many other headaches. Boiled down to its last analysis, however, the net result should be a higher tempo of business activity in northern California, to which the electrical industry most certainly will contribute much and, by the same token, should reap its proper reward."

As to its policy, in certain areas, Pacific Gas and Electric Co. will merchandise ranges and water heaters, air conditioners of the compression type, air heaters and roasters. Its rates are promotional. No special inducements are offered for direct sales, but it will carry on a continuous advertising program and take full advantage of county fairs. A planned systematic coverage of all dealers is contemplated by dealer promotional specialists and equal commissions will be paid to field salesmen for dealer sales made in their respective territories in order to stimulate their work with dealers.

A home economist program will embrace cooperative promotion with dealers and retail stores, work with domestic science classes in public schools and with other groups.

The company works closely with the Northern California Electrical Bureau, the Pacific Coast Electrical Assn., Pacific Coast Gas Assn., and other groups.

The company does not believe appliances will be available in sufficient quantities to meet consumer demand until late in 1946. Its estimates of unit sales were worked out some time ago and published in its last two postwar studies No. 5 and No. 6.

The lighting program for residential will consist of an active educational and promotional program conducted through home contacts among residential customers. No direct sale of equipment is planned for the immediate present. Prospects will be allocated to dealers. In commercial and industrial lighting, increased promotion will be had through field surveys of commercial and industrial customers. No direct sale of equipment will be made. Prospects will be allocated to installing dealers.

As to commercial cooking, a cooperative program through dealers with no direct sale of equipment but with company field specialists in metropolitan areas to call on hotels and restaurants will be the plan. In air heating, an active promotional program will be carried with some direct sale of major and auxiliary electric air heaters in all of the territory. Likewise, for air conditioning and evaporative cooling compressor type room coolers will be sold direct in certain areas and all types of air conditioning will be promoted for dealer sales throughout the entire territory.

Among new appliances, the home drier will be promoted in all areas and sold directly in some parts of the territory. The home freezer will be promoted in all of the territory but direct sales will not be made. Prospects will be allocated to dealers. There will be kitchen planning and adequate wiring promotion through a specialized home survey program with prospects allocated to dealers.

Pasadena L. & P. Dept.

As a municipal light and power department, Pasadena will do no merchandising. It will give general aid and information to customers and, on the dealer program, provide free range wiring. It is also participating in the new dealer organization of the Southern California Radio and Electrical Appliance Assn., and F. D. Frey, supervisor of customer service, is a member of its board.

Riverside Light Dept.

Free wiring of ranges and water heaters and service to major appliances and complete cooperation with dealers will be the program of the Riverside, Calif., Light Dept., which does no direct merchandising. Its plans were not complete as yet because all dealers were not considered to be in the field. The program used before the war will be followed.

San Diego Gas & Electric

In addressing the fall conference of the Bureau of Radio and Electrical Appliances of San Diego County (reported in some detail in the last ELECTRICAL WEST) A. E. Holloway, vice-president in charge of sales, described the company's policy in regard to promotion, advertising and assistance to dealers. Although the company had suffered because of drastic reduction in the aircraft industry and the ending of the war, surprisingly enough the load during December exceeded the wartime peak and the load did not drop. San Diego seems to have maintained its swollen population and the company is preparing for increased load by ordering a new 50,000-kw. generator.

Holloway said the company was going to develop a new method of sales promotion on a mass selling idea. Instead of door-to-door selling, it would

prepare the market for dealers. Features of the program will be an extensive advertising program, using radio, billboards, newspapers, display cards, and direct mail, an educational program of lectures and demonstrations.

Home economists will give assistance to dealers in making public demonstrations and holding cooking schools. There will be a window display service available and sales training courses offered. Appliance service men will likewise render assistance. Information will be prepared in the form of booklets on company rules and policies, rates and operating costs of appliances.

The sales department will have three branches to contact the public. These will consist of (1) a commercial and industrial lighting department, which will design and lay out lighting for stores and office buildings; (2) a gas central heat department for homes and stores; (3) a power sales department which will advise power customers on rates and service requirements.

Holloway announced the division of the commercial department which would have charge of the various activities. Domestic electric sales, including lighting sales under A. I. Benedict; power sales, including farm power, under P. P. Pine; commercial sales, including street lighting and government institutions, G. H. P. Dellmann; gas sales, R. J. Phillips; customer extentions, Walter Chapman; commercial rates, H. I. Dillin; advertising, F. M. Raymond; investigation of complaints, Truitt Richards.

Also announced was the company's policy in regard to electrical water heating. Outside of its gas territory, it will actively promote although it will not sell directly. In the gas territory it will not do any promotion but will not obstruct sales by any dealer and will welcome any such load that is sold. The same goes for electric space heating. Holloway pointed out, however, that the company wanted to be sure that the customer had an adequately engineered and properly sold job.

The company's rural business is growing so fast that it is having difficulty in keeping up with new extensions. Figures for customers were increased over those given to *Electrical Merchandising*, being those on the records as of Dec. 31. The estimate of various appliances for which there is an immediate market in San Diego is given in the accompanying table.

Small appliances:	
Mixers	8,000
Roasters	4,000
Coffee Makers	15,000
Toasters	20,000
Irons	20,000
Waffle Irons	8,000
Hot Plates	2,500
Heaters	8,000
Heating Pads	4,000
Sewing Machines	5,000
Clocks	15,000

Southern California Edison

Since answering the questionnaire for *Electrical Merchandising* in connection with sales possibilities in Southern California Edison Co. territory, R. R. Walbridge, vice-president, says, "We have not changed our opinion about the sales possibilities, however we have had to revise our estimate of the amount of merchandise that will be sold due to the inability of manufacturers to make deliveries and of the labor and material shortages which will materially affect the market.

"We have revised our estimate of appliance sales for the year 1946 as follows:

	Original Estimate	Present Estimate
Refrigerators	75,000	40,000
Ranges	10,800	7,500
Water heaters	5,400	4,500
Home freezers	5,000	10,000
Automatic washers	25,000	25,000
Conventional type washers	50,000	25,000
Ironers	15,000	10,000
Radio sets	100,000	75,000
Vacuum cleaners	50,000	75,000
Small appliances	175,000	125,000

"Other items that will soon appear on the market, such as automobiles and other non-electrical merchandise, will be in keen competition for the customer's dollar and undoubtedly will affect the future sales of electrical equipment.

"We are looking forward to a very active year in southern California and, barring shortage of labor and material, 1946 should make an electrical record."

In midsummer of 1945 the company announced that it would no longer merchandise electrical appliances. Instead it was decided to develop its domestic load through an all-out promotional plan and devote the entire activity to loadbuilding through the dealer. This program includes: (1) Selecting and training of personnel; (2) classification and acquaintance with the dealers; (3) promotion of the new water heating rate among dealers, plumbers and customers; (4) promotion of adequate wiring; (5) promotion of electrical equipment in the homemaking departments of schools; (6) assisting dealers in the selection and training of sales force, and (7) cooperation with the industry in quarterly periodical campaigns for one major and several secondary appliances during each period.

The tentative outline for the campaigns was as follows: first quarter—primary objective, electric water heaters and the new water heating rate; secondary objectives, electric roaster, blanket, air heaters (portable), and all-electric kitchen.

Second quarter—primary objective, electric ranges; secondary objectives, water heaters, home freezers, air conditioning, dishwashers and garbage disposal.

Third quarter—primary objective, refrigerators; secondary objectives, ranges, water heaters, air conditioning, home freezers, dishwashers and garbage disposal units.

Fourth quarter—primary objective, ranges; secondary objectives, water heaters, laundry equipment, dishwashers, garbage disposals and small appliances.

All programs will be supported by extensive advertising. Builders will be contacted as well as the architects in the territory. Sales training classes will be organized and dealer effort, it is planned, will be particularly directed toward the 1,200 wired homes on the lines of the company not now using electric ranges and water heaters. The display department will not only develop displays for district offices and suboffices but provide window and counter cards and other display material for cooperating dealers in connection with the quarterly sales campaigns.

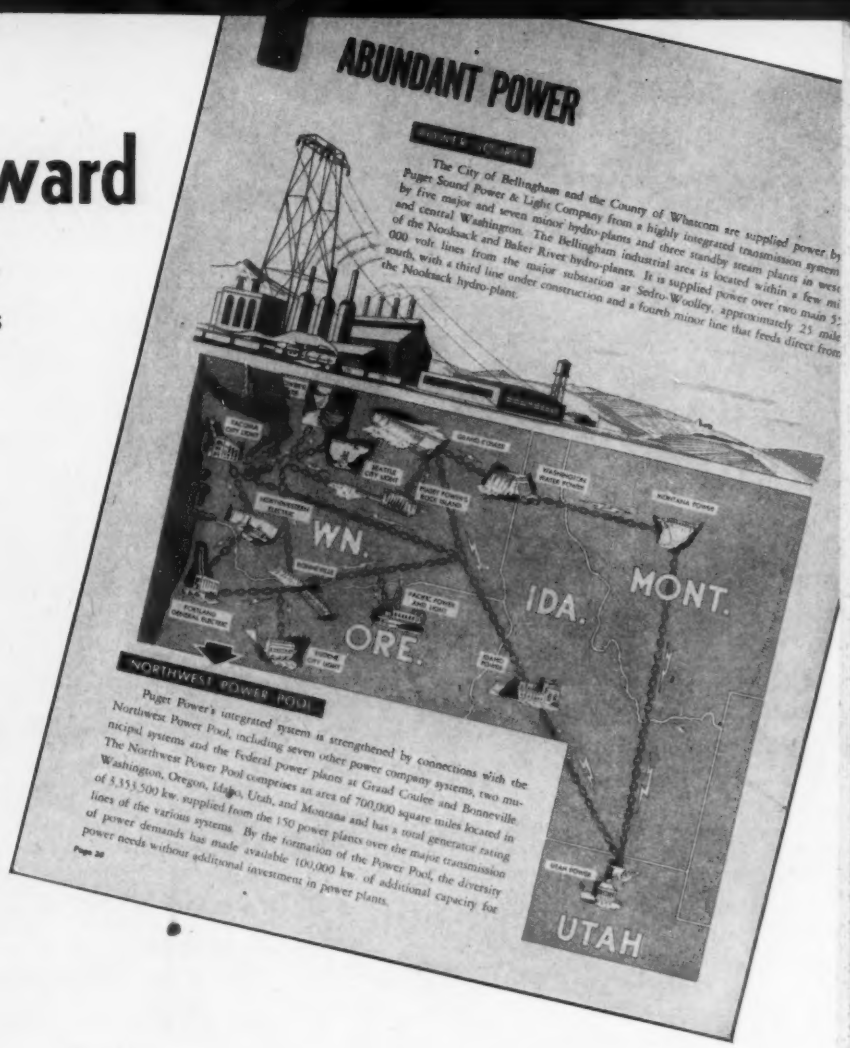
The home economics department will assist new range users in use of their equipment and train dealers and salesmen in better methods of selling electrical equipment through a knowledge of cookery. They will put on demonstrations before women's clubs and for newspaper-sponsored cooking schools. They will also work with the homemaking departments of schools and colleges, presenting the electric cooking story at least once a year to every class.

Monthly confidential reports of sales will be circulated to dealers and the consolidated report furnished to manufacturers, wholesalers and dealers. A monthly dealer bulletin announcing sales campaigns, sales ideas and other pertinent information will be put into circulation.

The company's commercial and industrial program will center around the idea of improving existing load and assisting industrial and commercial customers to find new equipment and applications which will be beneficial to their businesses. This is broken up into commercial, industrial and street lighting, commercial power and industrial power and to agricultural power developments. In lighting, rather than contemplate an aggressive sales campaign, it is the intention of the company to organize and train

Invitations Westward

Business and industry urged to locate new plants in the West by several utilities


ABUNDANT POWER
The City of Bellingham and the County of Whatcom are supplied power by Puget Sound Power & Light Company from a highly integrated transmission system by five major and seven minor hydro-plants and three standby steam plants in west and central Washington. The Bellingham industrial area is located within a few mi of the Nooksack and Baker River hydro-plants. It is supplied power over two main 5 000 volt lines from the major substation at Sedro-Woolley, approximately 25 mile south, with a third line under construction and a fourth minor line that feeds direct from the Nooksack hydro-plant.
WN.
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UTAH
NORTHWEST POWER POOL
Puget Power's integrated system is strengthened by connections with the Northwest Power Pool, including seven other power company systems, two municipal systems and the Federal power plants at Grand Coulee and Bonneville. The Northwest Power Pool comprises an area of 700,000 square miles located in Washington, Oregon, Idaho, Utah, and Montana and has a total generator rating of 5,353,500 kw. supplied from the 150 power plants over the major transmission lines of the various systems. By the formation of the Power Pool, the diversity of power demands has made available 100,000 kw. of additional capacity for power needs without additional investment in power plants.
Page 20

You can best serve all the West from Northern California
Good business logistics ...at a glance
Just a quick look will do.
That's all it takes to see this distribution to all the West is easier, quicker, cheaper from Northern California than from anywhere on the Coast.
For Northern California is the geographical center—hub of one of the most efficient transportation systems in the country. For example . . .
Three transcontinental railroads, more than 20 common carrier truck lines, 14 state-coastal and 17 coastwise steamship companies serve Northern California . . . fan out to bring every metropolitan center in the West within one day's ship.
Northern California . . . industrial center of the new Pacific World
PACIFIC GAS AND ELECTRIC COMPANY
P. G. and E. engineers will help you locate your plant
A well-trained Pacific Gas and Electric Company engineering staff has been built solely to help industrial executives learn the facts about locating in Northern California. This staff works closely with established agencies throughout the entire area, and its service includes at no charge . . .
A thorough study of available land, photographs, maps, aerial perspectives.
Complete information on transportation, transportation, drainage, trucking and freight rates.
Estimated cost of property, of any necessary improvements, of power and other utilities.
For more information, or assistance of any kind, write Pacific Gas and Electric Company, San Francisco 6, California.

Advertisements like these are run in important national magazines

Business is moving to BC
LUMBER is one reason why
What is your business? Does it depend on lumber, its cutting, hauling or processing? Are you concerned with the manufacture of furniture, doors, interior finish, boats . . . of plywood for airplanes, houses, or a hundred and one other applications . . . of pulpwood, paper products or plastics? If so, a profitable opportunity beckons you to British Columbia.
Lumbering is the most important industry in the Province. Facilities are well established to speed up every operation from forest to finished article. In 1944, production of Douglas Fir, Cedar, Hemlock and Spruce amounted to 8146,161,000. There are vast reserves of raw material . . . cheap hydroelectric power on Pacific tide-water . . . ample manpower . . . adequate transportation by water, rail, road . . . excellent factory sites.
As with lumber, so British Columbia offers a bright future for many another business! You benefit by all the advantages of rich natural resources in metals, coal, oil, fisheries, varied year-round crops. You enjoy the finest climate in Canada.
Remember, too, that British Columbia is Canada's Pacific stepping-stone to China, Russia, South Africa, India, Australia and South America . . . millions of customers for the modern products of Canadian industry; and B.C. is within easy reach of Alberta, Saskatchewan, Manitoba, a prosperous growing domestic market of some 3,250,000 people.
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There's Business for You in British Columbia
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Information Please
B. C. ELECTRIC
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Please send complete information on British Columbia to
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Business and industry thrive in Los Angeles because the industrial climate is good.
Take electric power, for example. Industries located in the city of Los Angeles have the advantage of the lowest general power rate of any major U. S. industrial center. Water resources ample for four times the present population encourage full development of industrial plants.
In labor supply, this bustling industrial area has more than half of all the manufacturing wage earners in the entire State of California. You know the value of such a reservoir of trained, high-type labor.
There is a breathing space for industries inside the boundaries of this, the world's largest city in area; its 451 square miles encompass ten distinct and widely separated industrial districts. This unique decentralization eliminates freight bottle necks, permits employees to live in pleasant home communities and still be close to the plant.
Population is shifting West. So is business and industry. Los Angeles City is the industrial and business leader of the West because it has the most favorable industrial climate. Ask for the facts on transplanting your business to this fast growing, profit stimulating center.
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DEPARTMENT OF WATER AND POWER
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"Serving the water and power needs of 1,700,000 citizens"
LOS ANGELES OFFERS INDUSTRY:
1. Rich market, expanding with the Westward trend
2. West's largest population and largest supply of skilled labor
3. A home owning community where people prefer to live and work
4. Lowest general power rate of any major U. S. industrial center
5. Water supply ample for city of 7,750,000, at reasonable rates
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7. Low construction costs; year 'round production schedules
8. Economic stability through diversified industry
9. Magnificent harbors; springboard to all the Pacific nations
10. Accessibility to the storehouses of raw materials in the West and the Far East
FOR BUSINESS EXECUTIVES . . .
NAME
TITLE
ATTACH TO COMPANY LETTERHEAD
Los Angeles IN THE WEST IN YOUR INDUSTRIAL FUTURE

The West's Wired Homes and Appliance Saturation by States as Appraised by Electrical Merchandising

State	Customers: Total Domestic and Farm Customers Jan. 1, 1946	Customers: Total Urban Customers	Customers: Total Rural non-farm Customers	Customers: Farm Customers	Washer Saturation: Washer users, gas and electric	Washer Saturation: % of State wired homes	Ironer Saturation: Ironer users	Ironer Saturation: % of State wired homes	Refrig. Saturation: Refrigerators, total home users	Refrig. Saturation: % of State wired homes	Range Saturation: Ranges, total home users	Range Saturation: % of State wired homes	Radio Saturation: Radio sets, total home users	Radio Saturation: % of State wired homes
Montana	101,670	53,500	36,055	12,115	83,886	82.51	8,465	8.33	65,075	64.01	24,361	23.96	146,400	87.09
Idaho	121,829	49,466	35,923	36,440	71,120	58.38	6,927	5.69	74,937	61.51	41,962	34.44	131,150	87.53
Wyoming	45,284	23,394	15,950	5,940	31,001	68.46	4,040	8.92	25,637	56.61	4,603	10.16	64,050	87.63
Colorado	241,904	153,098	61,776	27,030	173,242	71.62	16,738	6.92	140,011	57.88	22,183	9.17	280,600	84.38
New Mexico	67,780	38,086	21,769	7,925	29,178	43.05	1,924	2.84	35,497	52.37	3,469	5.12	73,200	54.14
Arizona	105,760	50,978	45,957	8,825	67,473	63.80	6,158	5.82	63,103	59.67	7,311	6.91	94,550	68.09
Utah	143,156	84,829	36,947	21,380	133,123	92.99	11,160	7.80	98,600	68.88	41,217	28.79	137,250	93.89
Nevada	28,047	12,874	13,193	1,980	14,589	52.02	2,116	7.54	21,692	77.34	9,206	32.82	27,450	83.46
Mountain	855,430	466,225	267,570	121,635	602,612*	70.56*	57,528	6.73	524,552	61.32	154,312	18.04	954,650	81.13
Washington	539,610	319,308	147,312	72,990	351,955	65.22	50,408	9.34	309,604	57.38	174,226	32.29	512,400	91.05
Oregon	306,763	171,549	82,409	52,805	193,300	63.01	26,744	8.72	183,397	59.78	110,728	36.10	317,200	89.48
California	2,270,336	1,708,385	431,376	130,575	1,369,525	60.32	236,652	10.42	1,362,651	60.02	130,680	5.76	2,101,450	93.81
Pacific Coast	3,116,709	2,199,242	661,097	256,370	1,914,780	61.44	313,804	10.07	1,855,652	59.54	415,634	13.34	2,931,050	92.83
U. S. Total	29,215,500	20,158,902	6,143,968	2,912,630	18,236,000	62.42	1,924,000	6.59	19,720,000	67.50	3,541,000	12.12	30,500,000	83.46

* Reflecting use of gas engine washers in homes without power.

the necessary field staff and to put them in the field, establish contact with customers and make them available when equipment and facilities are likewise available for expanded lighting development.

A course of training in lighting, sales methods and lighting techniques will be given the men. Work will be done with architects and with industrials, with schools and city officials and an extensive advertising supporting program will be carried on.

In commercial power is included the commercial air conditioning, refrigeration, commercial cooking and miscellaneous commercial power applications. Since the opportunities for promoting new commercial cooking loads appear promising, this field will be developed extensively. A cooperative sales promotion plan with dealers will be worked out in which the company will provide for customer demonstrations, continue its customer service and repair plan, do direct mail advertising, carry special campaigns in cooperation with restaurant supply houses and select and train new personnel to carry out the program. The staff of this department will be augmented and sales training given to the new men. In the agricultural program the objectives will be to retain existing loads, develop new pumping loads with better load-factor characteristics, encourage changes in pumping equipment and schedules to reduce plant sizes and spread hours of operation and procure all miscellaneous power business possible that has a non-seasonal characteristic. Dealers in farm electrical equipment will be encouraged to stock, sell and service such equipment. The pump testing program will be carried on also.

Colorado

Colorado Springs P. U. Dept.

While it has never merchandised directly, the Colorado Springs Department of Public Utilities has been very cooperative in its work with dealers and contractors. It has no definite dealer cooperative program.

Public Service of Colorado

While the Public Service Co. of Colorado will merchandise directly certain appliances and its plans are still under modification and not yet in definite form, it plans to have a very active dealer cooperation program. A complete department known as "Dealers' and Builders' Department" is being established with one supervisor each for electrical dealers' representatives, gas dealers' representatives, and architects' and builders' representatives, responsible for load building and cooperation through and with dealers and builders. A total of 12 men will be in this department.

Likewise, the company gives active support to the Rocky Mountain Electrical League and to its dealer program. It had been planned to expand the home service department, but it is doubtful whether this will be done in 1946.

Southern Colorado Power

Promotion through the press, radio, training schools, technical assistance, home economists, public cooking and lighting meetings will be carried on as part of the dealer cooperation program of Southern Calorado Power Co. The company plans to remain in the direct sale of electrical appliances and to support the Pueblo Electrical League.

In addition to the figures in the accompanying table for estimates of appliances which can be sold in 1946, 100 evaporative coolers and 25 attic ventilation units are entered.

In the commercial program, increased activity in promotions, surveys, layouts and recommendations will be given to commercial lighting, cooking, air heating and conditioning, and to the stimulation of sales of new appliances as they come on the market.

Idaho

Idaho Power

While Idaho Power Co., with headquarters at Boise, Idaho, plans to sell electrical appliances directly, its selling will be in low-use towns where promotional activities will include advertising, shows, fairs, public meetings, customer sales calls until such time as dealer selling takes up the load. The company will have a strong dealer cooperative program and assist in sales training, will make surveys of appliance potentials, do extensive advertising, develop prospects for dealers and contribute current trade information. It will also pioneer new appliances as long as needed.

The home service program will be resumed but its primary purpose will be trouble calls, giving demonstrations and cooking classes at public meetings and in making calls on new cooking customers to acquaint them

with the operation of their appliances.

As to the commercial program lighting and commercial cooking will receive active promotion. Lighting will get newspaper, radio, direct mail and display advertising with sales calls in low-use towns. New appliances of all types will get advertising and direct sales calls by company sales people. As for air heating no definite policy has been developed as yet. It is estimated that there may be 100 air conditioning jobs of the refrigerated type and some 200 evaporative coolers sold in the territory in 1946.

Montana

Montana Power

That the Montana Power Co., Butte, would not merchandise electrical appliances itself after the war was announced last year by D. J. McGonigle, general sales manager. Instead the company would rely upon the dealers, aided by the distributors and manufacturers, to develop its extensive market in the large state of Montana. Immediately studies were started to develop basic information of value both to manufacturers and dealers in this work. Much of this research is still going on. However, the first fruit of it, a comprehensive study of the dealers available for this distribution system, was published last summer.

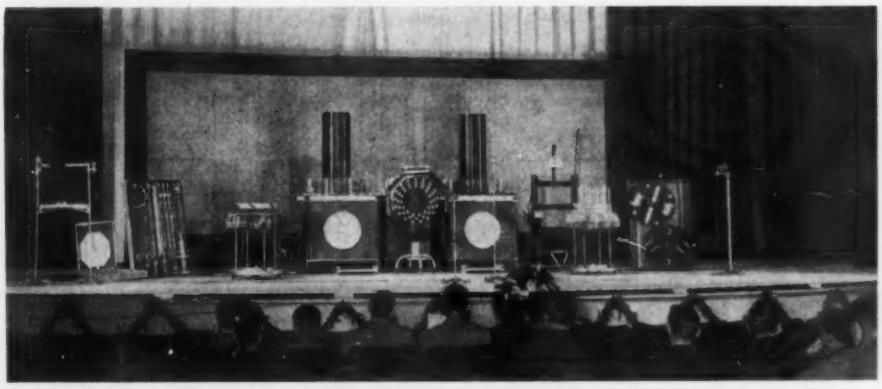
Entitled *Thar's Gold in Them Montana Hills*, the book lists names of every dealer in each of its divisions and in each town of each division, indicates whether this dealer was active in the sale of electrical equipment prior to the war and also whether he is interested in the same or other lines after the war. Then the tables show whether the dealer handles lamp bulbs, lamps and lighting equipment, major appliances, small appliances, radios, air conditioning and ventilation and, in the heavier equipment, motors and power, farm electric equipment and gas heating equipment. Other columns indicate whether the listed firm is also a wholesaler or jobber or an electrical contractor.

D. J. McGonigle in the introduction says, "It gives a geographic and brief economic description of the trade area served by the company, showing the cities and towns, the location of each of the company's divisions, the name and address of each division manager and the number of industrial, commercial and residential customers, both gas and electric, served by the company. Also listed are the names and addresses of business establishments in the territory which could well be contacted by those seeking postwar sales outlets."

Nor is this the only research being done. Breakdown figures of saturations and the potentials are being worked out.

The dealer cooperation program will include engineering assistance in the layout of wiring and lighting installations and commercial cooking applications, home service help from a crew of sixteen home service girls, the provision of sales training courses and support with extensive newspaper, radio and direct-mail advertising.

The home service girls will conduct appliance demonstrations for dealers. They will offer advisory service on residential wiring and lighting. They will assist in dealer sales training and cooking classes and carry on lighting promotion.



With its own "House of Modern Magic," put on by C. J. Lindeman, Public Service Co. of Colorado, before schools, clubs, scout troops, etc., a story of safety, economy and dependability of electric service was told to interested groups

Nevada

Sierra Pacific Power

At the moment, we have 70 electrical dealers in our system with their sales organizations all set up to really do a selling job, whenever appliances are available in constant volume. In addition to this number, we expect to have about 25 more dealers in the territory in the next few months.

All of these dealers, of course, will become a part of the "Reno Plan," which has continued to function just as effectively even through the war years as it did when it was first conceived back in 1932. Over this period of time, there has not been a single change in our fundamental thinking, which is something of a record in itself and, furthermore, plans for the future call for a continuance of the same program without any fussing around or trying out of different details. We certainly are not going to disturb a basic plan that has accomplished many things desirable in any utility and which over the years has been entirely justified from a sales volume standpoint, a cost standpoint, and more important, from the standpoint of dealer and public relations.

As for lighting, commercial cooking, air heating, air conditioning, etc., this will all be handled through the initiative of the individual dealer with our cooperation.

Reno is going to experience a steady growth for the next several years. The Chamber of Commerce estimates that we need 1,200 housing units immediately and that 300 new housing units a year will be required for a period to meet the demand. Actual construction work has started on one large hotel and plans are in the making for several more. Two new office buildings are also being planned. A large civic center has been proposed for downtown Reno which would include among other buildings, an enlarged post office, an enlarged court house, and a Veteran's Memorial auditorium capable of handling large conventions and all other activities peculiar to a community. The Lake Tahoe area will have a boom.

Taking everything into consideration, we are looking forward to the breaking of all existing sales records and our dealer organization is with us 100% to make it all come true through the medium of the "Reno Plan."— *A. L. Pierce, New Business Department.*

Southern Nevada Power

No direct sales will be made by Southern Nevada Power Co. at Las Vegas, Nev., the company which has the highest average residential kwh. consumption for the West. The company plans cooperation with local dealers. In the figures given in the table, there are included 100 air-conditioning jobs of the refrigerated type, 1,000 evaporative coolers, and 50 attic ventilation jobs.

Measurements of the Market—Saturation and Estimated Demand

Utility Territory	Estimated Present Saturation—Per Cent										Estimated Accumulated Demand in Units, 1946									
	Ranges	Water-H.	Refrig.	Washers	Ironers	Vacuum Cleaners	Radios	Ranges	Water-H.	Refrig.	Home Freezers	Washers, Automat.	Washers, Conv'l.	Ironers	Vacuum Cleaners	Radios	Small Appliances	Other
Alameda Bureau of Elec.	24	2	70	85	10	85	75	400	20	1,000	50	200	6	50	1,000	1,000	2,000	...
B. C. Elec. Ry., Vancouver	14	3	18	60	2.7	65	85	1,800	1,000	5,000	100	1,000	4,000	350	12,000	20,000	...	...
B. C. Elec. Ry., Victoria	12	4	...	...	...	...	...	500	300	750	20	50	1,000	100	2,000	1,000	...	...
Calif. Elec. Power	22.5	13.5	65.2	...	...	...	...	1,020	850	1,700	425	400	875	170	25	850	1,000	395[3] *
Calif. Ore. Power	49	30	65	75	5	80	86	2,500	2,000	2,000	500	150	800	100	...	...	...	...
Central Ariz. L. & P.	...	...	...	...	...	...	...	500	300	3,500	300	1,200	2,400	300	3,000	4,000	20,000	2,100[3]
Eastern Ore. L. & P.	40	15	80	85	10	75	95	450	350	800	400	200	600	200	600	1,000	...	26[3]
Eugene Water Bd.	58	30	...	...	...	...	...	1,000	500	...	...	...	...	...	...	...	...	...
Glendale P. S. Dept.	12	2	65	...	...	...	...	1,000	250	3,000	...	...	...	...	...	...	...	...
Hawaiian Elec.	23	13	82	50	2	20	95	5,000	4,000	10,000	1,000	5,000	5,000	1,500	2,500	20,000	...	...
Idaho Power	60	28	75	85	4	...	...	6,431	3,071	11,487	673	3,000	5,000	...	2,600	14,700	40,000	300[3]
Los Angeles Dept. W. & P.	6	3	70	...	...	...	...	6,500	4,600	25,000	50	40	200	20	150	400	...	505[3]
Modesto Irrig. Dist.	62	28	70	80	3	70	95	200	100	400	...	...	...	...	...	...	...	...
Montana Power	26	2	69	88	9	65	85	...	...	...	...	500	2,000	1,500	3,500	4,000	...	300[3]
Northwestern Electric	47	19	78	69	15	60	100	1,150	800	1,420	...	...	...	...	...	...	...	...
Pacific G. & E.	9	6	71	70	10	65	96	40,444†	1,921†	85,622†	36,344†	51,000†	100,405†	44,244†	145,719†	168,790†	50,191	1,611[3]
Pacific P. & L.	30	24	63	72	10	58	130	3,930	2,937	5,767	1,101	1,400	5,607	2,053	5,461	14,247	...	...
Pasadena L. & P. Dept.	7	2.5	67	...	...	...	95	350	100	3,500	300	...	...	...	...	...	...	...
Portland General Elec.	44	18	77	65	24	...	105	9,000	5,000	12,000	1,000	1,500	...	...	...	...	...	...
Public Service of Colo.	75	55	55	65	8	75	85	...	...	...	...	...	...	...	...	...	...	...
Puget Sound P. & L.	42	20	64	...	...	...	...	10,000	8,000	10,000	...	...	...	...	...	...	...	...
Riverside L. Dept.	16	3.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
San Diego G. & E.	7	5	78.2	67	7.4	75.4	116	2,175	2,000	18,000	3,000	5,000	10,000	5,000	9,000	30,000	109,500[3]	...
Seattle City Light	66	45	68	84	14	...	85	8,500	7,500	...	50	150	50	100	250	200	...	...
Sheridan County Elec.	...	...	...	...	...	...	...	100	...	200	...	...	...	...	...	...	...	...
Sierra Pacific Power	66	21	84	...	...	...	...	1,300	400	1,600	200	...	...	...	...	...	...	...
So. Calif. Edison	60	3	60	40	10	30	100	7,500	4,500	40,000	10,000	25,000	25,000	10,000	75,000	75,000	125,000[3]	11,500[3]
So. Colorado Power	20	7	65	65	5	80	95	300	300	1,500	100	100	800	100	300	2,500	10,000	125[3]
So. Nevada Power	80	80	75	80	10	85	85	1,000	1,000	1,500	200	500	1,200	150	300	720	...	1,150[3]
Tacoma, City of	57.3	42.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Telluride Power	17	0	50	90	...	...	90	...	...	...	...	...	...	...	...	...	...	...
Tucson G. E. L. & P.	8	2	70	45	1.5	...	98	...	...	...	...	...	...	...	...	...	...	...
Uintah P. & L.	9	9	50	30	...	...	50	400	400	400	75	100	200	50	175	400	...	50[3]
Utah P. & L.	40	5.5	75	67	3	85	100	...	...	...	...	...	...	...	...	...	...	...
Washington W. P.	38	33	76	65	10	50	98	6,500	6,000	9,200	1,500	2,000	8,000	1,000	5,000	18,000	...	...

[1] Clothes Driers. [2] Air conditioning equipment. * See accompanying reports for explanation. † From Customer Buying Intention Survey, No. 6 of Postwar Market Studies.

New Mexico

Albuquerque G. & E.

Except for indicating that it does not plan to merchandise electrical appliances, the Albuquerque Gas & Electric Co. has evidently not developed its program, for it had no figures or comments in answer to these questions.

Raton Public Service

Figures for Raton Public Service Dept., a municipal utility at Raton, N. M., are for the fiscal year June 30, 1944 to June 30, 1945. This department does not merchandise electrical appliances and has no particular dealer program.

Oregon

California Oregon Power

Although very active in direct selling of merchandise before the war, the California Oregon Power Co. does not intend to merchandise electrical appliances now. However, its program of dealer cooperation has not yet been definitely set up.

Eastern Oregon L. & P.

Advertising, promotional assistance, sales training classes and dealer meetings will be on the program of dealer cooperation for Eastern Oregon Light & Power Co. For the promotion of commercial lighting, cooking, air heating and air conditioning, similar advertising and promotional work will be done to aid the electrical dealers to sell such equipment. It is expected that about 20 evaporative coolers and six air-conditioning refrigerated jobs may be sold during this year. The company will do no merchandising.

"Our company discontinued merchandising in 1942," writes L. G. Gray, division manager, "but we plan on giving complete cooperation with dealers, including help in training of dealer sales people, displays, demonstrations and advertising. To create new lighting business, promotion men in the field will cooperate with dealers and contractors. The same is true of commercial and industrial as well as rural load building. Advertising and promotional work with contractors will be done on adequate wiring. Population in this area has increased approximately 10% the past year. Our emphasis will be on lighting, water heaters, ranges and home freezers."

Eugene Water Board

In the city of Eugene, the water board expects heavy sales of appliances if they are available. It does no merchandising and, therefore, has no basis for estimating other than ranges and water heaters.

It may possibly do some dealer cooperative advertising covering not only appliances but lighting, commercial cooking, etc.

Mountain States Power

Because the Mountain States Power Co. now feels that there are plenty of dealers now operating in the territory served by it, it does not contemplate any direct merchandising activity. Instead it will set up a department and carry on educational and promotional work in cooperation with dealers.

At the time of going to press, plans had not been developed because H. E. Farris, new business manager, had left the company to become affiliated with Stubbs Electric Co. in Portland and no successor had yet been appointed.

Northwestern Electric

The program of the Northwestern Electric Co., Portland, will be very similar to that prior to the war. It will have a crew of salesmen in the field creating prospects which will be turned over to the dealers but will not merchandise electrical appliances itself. Likewise, it will give support to dealers' cooperative organizations, one of which is being formed in the Portland area at the present time.

As to lighting promotion, there will be personal follow-up on commercial and industrial prospects, with a mass promotion effort on residential lighting. For commercial cooking and air heating, as well as air conditioning, there will be personal follow-up backed by direct mail, radio, window display and newspaper advertising as well as promotion. Air conditioning will be promoted but no effort will be made to follow this up. Any new appliances which appear will be given sales promotion, directing the sales through dealers.

It is estimated that about 100 evaporative coolers and about 200 attic ventilation installations can be sold in the area during 1946.

Pacific Power & Light

The Pacific Power & Light Co., according to D. B. Leonard, commercial manager, organized a few of its former sales representatives into a field staff to make a postwar survey of customers' requirements and needs in the use of

Merchandising—Dealers—Policy—Home Service

Utility Territory	No. of Dealers 1941	1944	1946	Plan to Merchandise Direct: Yes	No	What Lines	Dealer Policy in Brief: Share dealer advertising: $40 range allowance.	Prewar	Postwar None	Number of Girls Will Sell: Appliances	Lamps	Do Lighting Promotion
Alameda Bureau of Elec.	6	4	7		X							
Albuquerque G. & E.					X							
Anaheim L. P. & W. Dept.	12	2	22		X							
B. C. Elec. Ry., Vancouver	125	200	250	X		Ranges, water heaters, refrig.	Complete dealer promotion program.	6	12	No	No	Yes
B. C. Elec. Ry., Victoria	16	41	46	X		Ranges, refrig., w-h., home freez.	Complete dealer promotion program.	1	2	No	No	Yes
Calif. Elec. Power		52		X		All.	Dealer partic. in spec. campaigns.	3	3	No	No	Yes
Calif. Ore. Power	33	40	85		X		Undecided as yet.	2	0			
Central Ariz. L. & P.	160	151	166		X		Develop market, surveys, prospects.	6	8	No	No	Yes
Coast Counties G. & E.				X		Home lighting, some appliances.	Cooperative program.	1	1			Yes
Colorado Springs P. U. Dept.					X		None.					
Eastern Ore. L. & P.	22	34			X		Advertising, training, promotion.					
Eugene Water Bd.	20	24			X		Advertising.					
Glendale P. S. Dept.	12	6	66		X		Advertising.	1	1			
Hawaiian Elec.				?		?	Advertising promotion.	6	8	No	No	?
Idaho Power	410	469	519	X		All appliances.	Sales training, surveys, advertising, prospects.	8	8	Yes	Yes	Yes
Logan, City of	10	11	24	X		All appliances.						
Los Angeles Dept. W. & P.	180	300	450		X		Complete promotion program.	14	12	No	No	No
Modesto Irrig. Dist.	12	8	20		X		Field assist. and prospects.					
Montana Power	1,102	800	1,150		X		Eng., home service, sales training, advertising.	16	16	No	No	Yes
Mountain States Power					X		Promotional program.					
Northwestern Elec.	189	140	340		X		Create prospects for dealers.	13	10	No	No	Yes
Pacific G. & E.	1,567	3,000		X		Ranges, w-h., a-h., a-cond., roasters.	Complete promotion program.	x	x			
Pacific P. & L.	275	235	335	X		Small appliances; lighting.	Complete program.	13	22		Yes	Yes
Pasadena L. & P. Dept.					X		Free range wiring.	1	?			
Portland General Elec.	200	160	410		X		Dealer promotion division.	9	9			Yes
Public Service of Colo.	125	135	161	X		Ranges, w-h., home freez., ironers, dish wash., certified lamps.	Complete dealers' and builders' dept.	1	1			
Puget Sound P. & L.	614				Seattle		Sales train., spec. campaigns.	11	7			Yes
Raton Public Service	10	10	13		X	Ranges, water heaters.	None.					
Riverside L. Dept.	10	8	14		X		Complete cooperation. Free wiring.	1	1			Yes
San Diego G. & E.	175	162	277		X		Complete promotion program.	1	x			
Seattle City Light				X		Ranges, w-h., commer. cooking.	Advertising; wiring allow.; sales help.	3	3	No	No	No
Sheridan County Elec.	6	4	14	X		Refrig., ranges, w-h., home freez.	Yes, when organized.					
Sierra Pacific Power	65	50	90		X		Reno plan.					
So. Calif. Edison	400	1,242	1,500		X		Broad promotion program.	1	2	No	No	No
So. Colorado Power	25	18	27	X		All appliances; lamps.	Promotion; sales train., etc.	11	9	No	No	No
So. Nevada Power	5	9	13		X		Cooperation with local dealers.	4	4	Yes	Yes	Yes
Tacoma, City of					X		Cooperation program; advertising.					
Telluride Power	14	36	34		X	All appliances.	Dealer meetings; group demonstrations.	2	2			
Tucson G. E. L. & P.	30	24	34	X						Yes	Yes	Yes
Uintah P. & L.	2	6	9	?		?		1	1			
Utah P. & L.	800	1,100	1,300		X		Promote sales for dealers.	2	2		Yes	
Washington W. P.	294	185	310		X		Complete cooperative program.	13	13	No	No	Yes
							Advertising; sales train.; general promotion.	43	20	No	No	Yes

* See accompanying reports for details and interpretation.

Division and general office sales staff of Utah Power & Light in conference with W. A. Huckins, sales manager, to coordinate sales promotion program for system

electrical appliances. The staff was insufficient to cover the entire system, but over 11,000 calls were made before a dearth of manpower made it necessary for those making the survey to fill positions more urgently required in the company's operation.

The data from these field calls were supplemented with information secured by Guy E. Davis, domestic sales supervisor, in his field calls on distributors, manufacturers and dealers. The potential market for appliances became so impressive that a summary was prepared in the form of a booklet to show dealers the volume of sales available to them if they hired salesmen and aggressively engaged in merchandising as soon as appliances are available. His calculation of 31 million dollars worth of appliances to be sold in the territory served by that company in the next five years has been broken down in the booklet. This was then likewise charted for the various appliances in each of the companies' districts. It was then charted both in units and in possible dollar volume and was followed by a chart showing the unit sales per thousand homes of the four major electrical appliances.

The booklet also contains an estimated gain in residential and rural customers and a very useful calendar chart showing the percentage of sales of the various appliances during each of the 12 months of the year. This is to give dealers an idea when to make their own programs for the extensive promotion of the individual appliances.

These valuable market data are further broken down for each appliance and radio to indicate the number in use on December 31, 1936, on December 31, 1945, and the estimate for December 31, 1950, supplemented by figures for increased saturation 1946 through 1950, replacement sales at a reasonable percentage of 1936 installations and a summary of total unit sales between 1946 and 1950 which is then translated into a five-year dollar volume on a given unit price per appliance. Because this is broken down into districts, it gives the dealer a measure by which he can gauge his own activities and set his own quotas and sales effort.

While Pacific Power & Light Co. will merchandise, it will confine this to small appliances and to lighting. No particular emphasis will be placed on direct appliance sales. However, its dealer program will include dealer coordinators, home service advisors, extensive advertising and sales training. The home service staff will be increased to 22 from a prewar of 13. These women will recruit and train home service advisors to assist dealers and to promote home lighting.

The figures in the table showing the estimate for sales, are the estimate for 1946 sales if appliances are available, and under the column "other" is included 726 refrigerated air-conditioning jobs, 100 attic ventilation jobs and 705 furnace and non-portable fans.

Portland General Electric

About the same dealer cooperation program will be in effect as prewar in the system of Portland General Electric Co. Part of the general sales department will be a dealer promotion or dealer development division. The company will not merchandise.

"As to our 1946 program" says A. C. McMicken, general sales manager, "but few of our sales department employees in the armed service have so far returned. We hope to set up in the sales department a commercial-industrial power division, a commercial-industrial lighting division, a dealer promotion and residential division to build load under these classifications, much as we had in effect prewar. We are planning ahead for adequate wiring educational campaigns and to encourage all-electric homes, that is, homes adequately wired and lighted, with completely planned electric kitchens and laundries.

"We believe our big job in the commercial field will be to encourage fluorescent lighting installations, which will not reduce the wattage of present incandescent lighting installations.

"We believe that dielectric and induction heating offers many possibilities for new loads in our area and we intend to survey our industrial customers and encourage such installations where they are practical and profitable. We do not believe that, at least during 1946, a great deal of effort toward the promotion and sale through dealers of ranges, refrigerators and water heaters will be necessary because we do not feel that these products will be manufactured in sufficient volume during 1946 to satisfy the dealers' requirements."

Utah

Logan Municipal Electric P. & L.

The Municipal Electric Power and Light Plant of Logan, Utah, does no merchandising. Being simply a service organization in the city government, it has no commercial program and will have no dealer cooperative operations.

Telluride Power

Although the Telluride Power Co. at Richfield, intends to merchandise actively, it will hold dealer meetings and will offer dealers its facilities to hold their cooking schools and group demonstrations in company offices and will provide other sales helps. Its local advertising will include local newspapers, direct mail to a selected list, stuffers with monthly statements and use of billboards. Demonstrations will be conducted at county fairs and before cooking school groups.

Utah Power & Light

A continuation and expansion of its present program is the intention of Utah Power & Light Co. and its subsidiary, the Western Colorado Power Co. This includes full cooperation with dealers and with the balance of the industry. It will maintain a staff of sales promotion men to carry out this program. Likewise, it gives

full support to the Intermountain Electrical Assn. At a recent meeting of all dealer sales promotion men and division sales managers, W. A. Huckins, general sales manager, stressed the importance of planning for the sales program which is soon to be put into effect. He said further that sales personnel and division sales personnel are being augmented to a maximum in order to carry out the sales promotion plan successfully.

Electrical dealers in the territory served by the two companies can expect and will receive full and aggressive power company cooperation in their business development activities, he declared. At that meeting J. F. McAllister, manager of residential sales, M. L. Cummings, advertising and sales promotion manager, J. L. Shaw, manager of commercial sales, G. B. Walker, manager of industrial sales and Vere C. Halliday, sales training director, as well as Evelyn Hansen, home service supervisor, outlined plans they are now making for development of business for the entire industry.

The company's commercial sales program for 1946 will consist principally of personal calls on all customers by its commercial salesmen. They will promote the sale, through dealers, of various commercial services, such as lighting, cooking, refrigeration, air conditioning, new equipment, etc. They will also make layouts for lighting and cooking. They will work closely with and render information service to architects, contractors, builders, etc.

Considerable amount of direct mail advertising will be done to promote the various commercial services. Most mailings will include a return postcard in order to secure prospects. Commercial salesmen will not specialize in any one phase of commercial business but will sell all services applicable to their customers.

A sales training program has already been started for dealers and distributors in the area, using the Edison Electric Institute—National Electrical Wholesalers sales training material, such as sound slide films, moving pictures, lectures, sales courses, etc.

Uintah Power & Light

It will be the program of the Uintah Power & Light Co., at Roosevelt, to promote sales for all dealers. It does not have a sales organization but all employees are trained to help dealers.

Washington

Puget Sound Power & Light

Only in Seattle will Puget Sound Power & Light merchandise and there only ranges and water heaters because in this territory it competes directly with Seattle City Light, which likewise sells direct. Throughout the territory, however, it plans to give assistance to dealers in sales training and special campaigns, provide information relative to rates, service, and cost of operation of electrical equipment, and do extensive advertising.

The general outlook for the home appliance market in the territory served by Puget Power is excellent. The controlling factor on sales of ranges, water heaters, refrigerators and other major appliances is the number that will be allotted to this area in 1946 by the various manufacturers. The critical housing shortage will, we believe, stimulate a tremendous home building program the moment materials and labor are available. This, coupled with the desire of thousands of home owners to modernize by adding various units of electrical equipment, would appear to assure a ready market for all of the equipment that will probably be allocated to this area. There is evidence of great interest in the newer home appliances such as automatic washing machines, dishwashers, clothes driers and quick freeze units. If this new equipment is available in reasonable quantities, aggressive dealers should be assured of a diversified and satisfactory sales volume.

On every hand we see beginnings of industrial plant expansion and the beginnings of many new industries. This, together with the general activity of expanding and enlarging commercial and service businesses, provides a more optimistic outlook as to our chances of absorbing displaced war workers and the returning veterans in this area. This outlook would seem to assure considerable markets for homes and home appliances of all kinds.

Dealers in our territory are looking forward to a large volume of domestic appliance business in 1946 provided that equipment is available. We believe, however, that this optimistic view is justified only if sound sales practices and programs are adopted. Sooner or later we must face the fact that business comes to those who go after it. Any thought that the electrical merchandising business can continue to prosper without sound and aggressive sales promotion and a direct selling program, will ultimately result in a material retardation of electrical appliance business.

Every retailer and distributor of electrical equipment should constantly be reminded of the fact that there are millions of young people who are about to buy their first electrical equipment. The ultimate competition for the purchaser's dollar may result in these sales being only a small frac-

Sales help books by Montana Power, Utah P & L, Pacific, Puget Sound P & L, B.C. Electric, San Diego Gas & Electric

tion of what they should be in order to assure proper customer acceptance in the future.

Seattle City Light

The Department of Lighting for the city of Seattle, popularly known as City Light, according to P. C. Spowart, commercial manager, will merchandise direct ranges, water heaters, and commercial cooking equipment. "Our efforts will be directed to promotion of greater use of automatic electric hot water heating in the home and business. Our all-electric residence rate requires the exclusive use of an electric range and automatic tank water heater to qualify for the rate. This rate is the foundation of our program. We will also continue to be active in the promotion of adequate wiring and commercial cooking and water heating.

"Our advertising will stress the electric dealer as a source to buy electric appliances. Any promotional subsidy on electric wiring and plumbing installations will be extended to dealer sales as in the past. Our sales efforts, home service and auditorium facilities will be coordinated to help the dealer in every way possible."

The local Association of Appliance Dealers will receive support from the department. Dealer salesmen training will also be carried out.

Further commenting on the situation, P. C. Spowart, sales manager, said, "However, you will be interested in the result because it reflects the increased use of electricity in the home for automatic electric water heating. The resulting load factor from this use proves the combination of an electric range and an automatic electric hot water tank to be a most desirable electric utility load."

Data on Residential Service

Year	Kwh delivered	Accounts	Annual kwh per Account
1944	286,060,445	88,132	3,246
1945	325,045,495	89,644	3,626

Tacoma City Light

As it has in the past, the City of Tacoma Light Department will merchandise directly ranges and water heaters and, in promotion of this merchandising, will do considerable advertising and make displays. However, it will take an active part in the dealers' association and support a dealer cooperation program. The dealers' organization is called Tacoma Appliance Dealers Assn., which is affiliated with the Better Business Bureau at Tacoma.

As well as pushing range and water heater sales, Tacoma will push commercial cooking and lighting. Its home service girls are demonstrators only.

Washington Water Power

Likewise ceasing to merchandise electrical appliances directly the Washington Water Power Co. is planning a strong promotional advertising program, a general sales training program and personal contacts on an organized basis. It will conduct numerous dealer meetings to assist in sales training and in development of the market.

The home service department at a customer's request will assist on problems regarding cooking, lighting, refrigeration and kitchen planning. Home demonstrations will be given to users of electric ranges. Through group meetings they will promote the use of electric ranges, roasters, lighting, etc. They will assist dealers in training sales personnel on the use of electric ranges.

The figures originally given to *Electrical Merchandising* were revised for ELECTRICAL WEST to eliminate those statistics applicable to the territory lost to PUDs through condemnation. This adjustment makes the comparison of more value as an indicator of business development.

In commenting on the future of the territory, W. L. Thrailkill, assistant general manager, has this to say:

"In preparing plans for the reactivation of our sales and promotional programs for 1946, we feel that conditions are not altogether unfavorable as far as sale of commercial service is concerned. While some items or lines of commercial lighting, heavy duty cooking, and refrigeration equipment, etc., will probably continue off the market for several months longer, the nature of sales effort in the commercial field is such that we feel we can get back to selling about as rapidly as former sales employees return from the war or new men can be adequately trained. Of course, we are daily losing some opportunities in that many commercial establishments are making plans for modernizing or for new structures, and not having a complete staff of trained personnel, we are missing the opportunity to promote the full use of electric service.

"In the residential market the problem is somewhat different. Dealers apparently will not begin to receive electrical merchandise in any appreciable quantities for three to five months. With a situation of nearly empty shelves and with the pent-up demand for merchandise greatly exceeding the supply, it may be several months before an intensive promotional selling program will be at all timely.

"After analyzing our needs, we believe that we must direct our promotional efforts toward that group of low- and medium-use customers. In the relationship of their use of service and our all-electric rate, such customers are on the threshold of our lowest cost electric service. The missing link to more use, then, is generally the substitution of an electric range for a coal or wood range, or an automatic electric water heater for the old stove reservoir or coils. Our efforts, therefore, are being planned to develop dealer sales primarily to that class of customer. We feel that for the first time we will really be doing a purely promotional sales job on *use* of service and in such a way that will develop the sale of merchandise by dealers."

Wyoming

Sheridan County Electric

Although the Sheridan County Electric Co. at Sheridan, Wyo., will merchandise direct, it intends to carry on a program of dealer cooperation when this can be organized. No organization exists at the present time. It will carry on advertising programs through newspapers and radio.

Canada

B. C. Electric Railway

With a very broad dealer promotion program, described in detail in a booklet *Let's Sell Again*, the British Columbia Electric Railway Co., Ltd., both in Vancouver and Victoria, made clear its cooperative policy. The booklet, issued in August 1945, was reviewed in some detail in ELECTRICAL WEST at that time. It sets forth the advertising allowances which the company will make on appliance sales, urges dealers' sales reports for mutual information, outlines its plan for automatic electric and gas water heater sales, offers a trade-in plan on gas and electric ranges, provides sales training plans and a window display service, and outlines the promotional plans for development of the appliance market with company advisers and assistants.

The company will continue to sell directly with its own sales crew electric and gas ranges, ovens and rangettes, electric and gas water heaters, refrigerators, both gas and electric, gas and electric heaters other than portables, electric water systems in rural areas, lamp globes, repair parts, and such new appliances as require development of consumer acceptance. It will discontinue the sale of floor lamps, table lamps and small appliances, and will

There's a Job for Joe at the Water Power!
Washington Water Power Co.
for Better Living
you'll want a modern Automatic Refrigerator
Now You See It . . . Now You Don't!
Cheyenne Light, Fuel & Power Co.
It's Natural to Cook with Electricity
IN TACOMA-Home of America's Lowest Electric Rates
SAFE ECONOMICAL CLEAN
FOOD TASTES BETTER
a water heater will qualify you for the NEW "All Electric Home" RATE
PORTLAND GENERAL ELECTRIC COMPANY
NOW I RUN ALL THESE FOR ONLY $5.70 A MONTH*
AT NORTHWESTERN'S NEW BARGAIN RATE FOR ALL-ELECTRIC HOMES!
NORTHWESTERN ELECTRIC
YOUR POWER COMPANY REPORTS TO YOU
. . . on its Service to You during 1944
COST OF YOUR ELECTRIC SERVICE CONTINUES DOWN!
THE WASHINGTON WATER
USE RIGHT-SIZE BULBS FOR
BACK IN THE HORSELESS CARRIAGE DAYS
2 Circuits Were Ample!
WRONG
RIGHT
BUREAU OF RADIO AND ELECTRICAL APPLIANCES
Let Us Amaze You with a few figures
PUGET SOUND POWER & LIGHT CO.
MORE PEP WITH GOOD LIGHT!

Advertisements, during 1945, swung back to more commercial themes, after devoting their war years to campaigns and ideas to assist the war effort. Here is a typical group of ads from various utilities, some signed by the company, some by a bureau or dealer organization. The themes ran the gamut from re-employment of veterans, through services and rates, to light and adequate wiring. These are but a representative few of many thousand ads

place less emphasis on its own selling of such appliances as have high saturation and good acceptance.

The advertising allowance is $3 on each electric range sold by its dealer, $3 for electric automatic storage water heater, and one-half of one per cent allowance on reported sales volume as outlined in the monthly sales report form supplied by the company on which each dealer lists his monthly sales. Under the latter, such farm equipment as brooders, milk coolers, dairy water heaters, motors, etc., will also be qualified for advertising allowances.

The company's advisory services include home service, kitchen planning, home lighting, commercial and industrial lighting, rural electrification and power installation, commercial and industrial gas services, electric appliance repair department, and industrial research. There was to be an increased staff of the home service division, to possibly ten, and of home lighting advisory staff by two. Lighting activities will be confined to every complete advisory service for both domestic and commercial establishments and calls for a staff of six to render this service. As to commercial cooking, the company will have one or more special representatives in its light and power division to advise regarding use of commercial cooking and baking equipment but will not make any direct sales.

In addition to active support of the Electrical Service League of British Columbia, it also works closely with the Canadian Association of Radio and Appliance Dealers and the Retail Merchants Assn. of Canada. In the Electrical Service League, the Home Appliance Council was established in 1939 to assist in the merchandising of appliances through dealers. Previous work with the Vancouver Electrical Assn., the Electrical Contractors' Organization, has channeled wiring installation through that organization.

"With regard to the general situation in British Columbia," says H. N. Walters, acting general sales manager, "our particular problem at the present time and for the next years will be the creation of living quarters for our swollen population. You probably have seen that our population, according to the last ration book figures, is over 970,000, having risen by 150.000 in the last three years. Much of this increase came from the prairies where rural residents left farms and small communities to come to the Coast, attracted principally by war industries. Most of them intend to stay if they possibly can. On top of this we have about 80,000 ex-service people from other parts of Canada who are taking their discharge here. Accurate figures are not available but in recent months a check shows that at least 30% of all servicemen coming to the Coast previously made their home in some other part of the Dominion.

"Our company initiated and is still fostering a widespread advertising campaign featuring British Columbia and its natural resources, with a view to attracting industries to provide employment for this growing population. Our University is bulging with 5,000 students, many of them from the armed forces, and is carrying on with accommodation planned for less than 2,000. From among these we shall find trained technical personnel to help with the industrial growth which cannot help but locate here. With our proximity to the awakening Orient, we are strategically located for export business to Pacific markets. This all means prosperity when some of our immediate problems are solved, and, in turn, adds up to enlarged appliance sales opportunities.

"Our recent market survey, during which we made over 120,000 completed interviews with our customers, discloses a very large potential market for ranges, refrigerators and water heaters. When our analysis is complete we shall give you complete statistics for publication for the benefit of other member companies in our industry."

Hawaii

Hawaiian Electric

According to C. E. Nolan, promotional manager, Hawaiian Electric Co. will continue to merchandise direct but will also assist dealers by advertising and promoting the more general use of electricity. It will also make available to all electrical distributors and dealers in the territory the services of an experienced appliance sales councilor. Through the work of his office, it is hoped that the industry will be greatly benefited by having better trained sales personnel.

Although no dealer organizations exist, assistance may be given to the formation of such a group during the year.

The company's whole postwar program has not been completely developed owing to the lack of trained personnel.

"With the generally disturbed labor situation," says Nolan, "and the uncertainity of appliance delivery, I hesitate to make predictions for the next several months. However, we have engaged L. W. Clifford, who has been connected with the electrical industry for the past 20 years, to come to Honolulu to set up sales training courses and in general act as a sales counselor and coordinator for all persons engaged in the electrical industry on this island."

Bureaus, Leagues

Northern California Electrical Bureau

Although not spectacular, the work of the Northern California Electrical Bureau has been steady and result producing. Its program, too, for 1946 will expand with the need to grow with an expanding market and opportunity. During the war, except for the lighting counsellor, Clark Baker, its work has been done by committees rather than staff. The bureau will again have a manager and staff as soon as conditions warrant, its officers have declared.

At its annual meeting in January, Louis J. Breuner, of Breuners stores in Oakland and Sacramento, was reelected president. Al Meyer, Leo J. Meyberg Co., was elected vice-president; A. E. Rowe, treasurer and O. R. Doerr, Pacific Gas and Electric Co., secretary. The executive committee is headed by Jack Ross, Pacific Gas and Electric Co., chairman, with Fred Benz, U. S. Rubber Co., chairman of the wiring section, Ben Tassie, General Electric Co., the appliance section; A. E. Rowe, the radio section; Walter Thompson, Westinghouse Lamp Division, the lighting section; George C. Tenney, ELECTRICAL WEST, educational section; and Charles Goodwin Jr., General Electric Supply Corp., A. H. Meyer and T. L. Rosenberg, Oakland, as members at large.

Reporting for the lighting section, W. H. Thompson showed that this phase had been a very active one during the past year. It had participated in home planning institutes in 24 cities, reaching an estimated 45,000 interested prospective builders of homes with a lighting message. Clark Baker, Walter Carlson, Victor Fink and Jack Hammond had carried on this assignment. The business planning institutes likewise had talks on lighting by Baker, Ruben Lagerstrom, George Sommers, Gilbert Trosper and George Leyes.

A lamp socket filling campaign had been carried on in November among 2,000 dealers in northern California, stressing the availability of lamps again, the need to fill empty sockets and have spares on hand. The Christmas lighting activity was through necessity curtailed because of lack of equipment but all who still had equipment were urged to light outdoor trees. Some 300 chambers of commerce and

250 newspapers responded to this idea and publicized the program, some chambers of commerce telling the story over radio to local communities.

The lighting committee likewise prepared a fluorescent lighting bulletin for California schools as a supplement to the bulletin, *Recommended Practices for Lighting California Schools.* The wiring committee was then asked by the California State Department of Education, schoolhouse planning division, to prepare a *Recommended Practices for Wiring California Schools,* which was published in ELECTRICAL WEST. Reprints are being distributed to school executives throughout the state.

The wiring section, under Fred Benz, has also been preparing adequate wiring standards for a certification program in northern California, and a supplementary booklet for use among building owners.

Among the projects discussed by the executive committee for 1946 were a lighting educational program for wiremen and contractors similar to the one Clark Baker conducted before the war; an electronic heating school and exhibit in four or five northern California cities for industrials and a kitchen lighting fluorescent fixture campaign among electrical dealers.

San Diego Bureau

In many ways perhaps, the busiest year of its 12-year history was closed by the Bureau of Radio and Electrical Appliances of San Diego County, according to its Secretary-Manager J. Clark Chamberlain.

"During the trying months of 1945 we grew strongly in membership and extended the already broad scope of our activities to more completely cover the specific fields of electronics and electrical contracting, through establishment of separate divisions for those having such special interests."

Most spectacular of the past year's activities were the two conferences, one May 15, the other Nov. 27, both of which were reported in considerable detail in ELECTRICAL WEST. In a year of changing conditions, these conferences were especially valuable as a means of bringing to the dealers of San Diego such assurances as were possible in regard to availability of merchandise and to give them first-hand information from manufacturers' representatives and distributors of the current situation.

Less spectacular but very important was the advertising campaign carried on during the year under the chairmanship of O. G. Thompson, assisted by F. M. Raymond, advertising manager for the utility company. Practically the entire year's advertising was devoted to the building of a demand for adequate wiring. This was considered highly essential to future distribution of appliances.

Another important work during the year was publication of the booklet, *Appliance Retailing Outlook* for distribution to those who planned to become dealers. A five-man committee prepared this booklet; it was published in March, and distributed free of charge through the Veterans' Bureau, banks, and wholesalers and distributors. It received national recognition and was reprinted in many publications.

Another important piece of work was on radio interference. Under Chairman Harry Callaway, local radio station assistance was given to publicize free interference service, and in June serious interference with a Mexican station was amicably corrected to the benefit of the entire area. A radio apprentice training program was also carried out throughout the year in cooperation with the local vocational school.

Last summer work was started to develop a closer tie-in with electrical contractors and with electronics technicians. Two new divisions of the bureau were created. The contractors' division includes contractors, wholesalers, inspectors, utility men, and others interested in wiring and lighting. J. F. Zweiner was appointed chairman. The electronics division for radio dealers and technicians elected Ray Dobler as chairman and Grayson Lovell as vice-chairman. Both groups have held educational meetings.

To prevent conflict of dates for product showings and meetings, the bureau instituted a booking service for manufacturers and distributors, assisting them to prevent conflicting date for product showings in that territory. Secretary-manager Chamberlain visited 22 appliance manufacturers in the midwest and was re-elected a director at the annual conference of the International Assn. of Electrical Leagues.

Plans for 1946 include, hopefully, the re-establishment of the annual spring fair during the last week in April and the eleventh annual electrical show late in November in Balboa Park. Both will depend upon the availability of both merchandise and meeting places. The U. S. Naval Hospital still occupies Balboa Park but there are indications that they may vacate some of these buildings in time for the fall show. The spring fair will be held in April if a building can be found.

Two industry conferences will be held, one in the spring and one in the fall, likewise using a new location in order to assure sufficient capacity to accommodate the entire membership and to include salesmen as well as owners of dealers establishments. Regular meetings of the electronics and electrical contractors divisions will be held.

The bureau's advertising and promotional program will continue. It will begin the promotion of all types of appliances as well as adequate wiring. The radio training program with the vocational school will be continued and a new sales training program is contemplated. Full support will also be given to the Home Planners Institute.

The bureau's board of directors is led by Frank J. Guasti, Parmelee-Dohrmann Co., who was chairman at the time the planning committee of the bureau made its unique report, *Guide to Profitable Appliance Selling.* Lou Wiese of Wiese's Ltd. is first vice-president and O. G. Thompson, General Electric Supply Co., second vice-president, and Sam L. Hall, Electric Supplies Distributing Co., treasurer.

Fall conference of San Diego's bureau, Manager Clark Chamberlain acts as MC

Rocky Mt. Electrical League

As outlined in the January issue of ELECTRICAL WEST, the Rocky Mountain Electrical League executive committee in December set up a program

for 1946, which will include an electrical exposition in Denver during the late fall, a strong adequate wiring program, and revival of the Christmas lighting on a competitive, area-wide basis next winter

Manager Ralph L. Hubbard now has a field representative, Meryl Mentzer, whose work is to assist in the development of local electrical leagues throughout the Rocky Mountain territory. He will also work with inspectors, contractors and dealers on adequate wiring promotion, codes and ordinances, unsafe appliance ordinances and state codes.

The electrical exposition will be held in the fall, at which time appliances and home electrical equipment will be available in more nearly the full production quantity.

For its utility members the league will hold bi-monthly meetings of executives in various parts of the RMEL territory to correlate labor, management and supply problems, government regulations and competition. The annual convention has been set for Sept. 5-7 at Stanley Hotel, Estes Park, Colo.

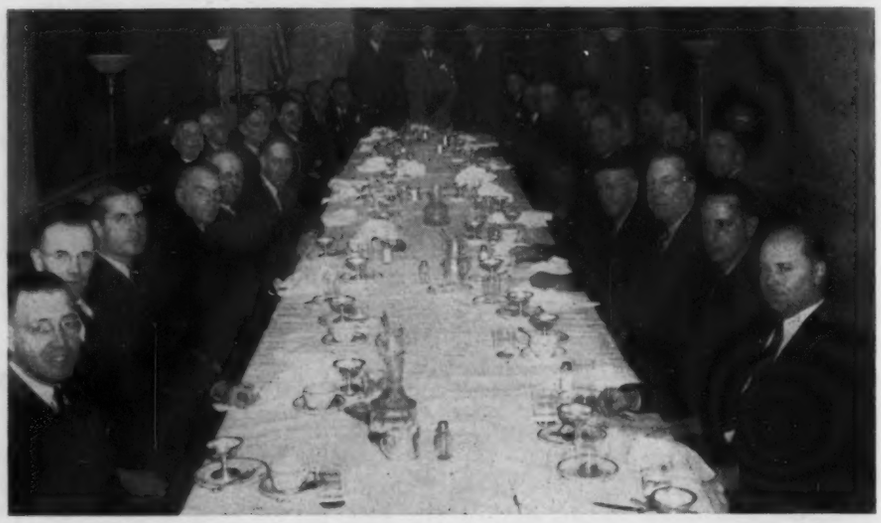
Southern California Radio and Electrical Appliance Assn.

Despite three moves of its office, part-time and inexperienced help, no furniture and lack of a telephone, the sturdy, new-born Southern California Radio and Electrical Appliance Assn. struggled through its first three months of operation and came up with a remarkable record of accomplishment for such a short time and under such difficult conditions.

Moved now to a permanent office at 1033 S. Grand Ave., Los Angeles, Gerald W. Weston, managing director, declares the association is increasing its membership and making steady progress. All the preliminaries have had to be cared for, such as incorporation, setting up of bookkeeping and accounting systems, bonding, printing, and obtaining of the decalcomania transfers for use of members on store windows, etc. Likewise, preliminary steps have been taken for participation in various shows and expositions being held in the area. The Construction Industries Exposition and Home Show to be held July 12-21 in the Pan-Pacific Auditorium will have in it a united massed radio and electrical appliance exhibit under the sponsorship of the association. The association became a member of the sponsoring organization along with the National Electrical Contractors Assn. Los Angeles Chapter, Los Angeles Chamber of Commerce, and other groups.

In facing the new year, the directors are holding meetings in which details of the program are now under development. At the organization meetings, officers elected were Robert H. Cockfield, Department of Water and Power, president; George Nicholson, Nicholson's Radio and Appliance Stores, vice-president; Walter L. Stickel, Leo J. Meyberg Co., secretary; Jack E. Kaplan, Western Home Furniture Co., treasurer, and a board of directors, consisting of dealers, manufacturers, chain stores, department stores, utilities and distributors.

Objects and activities of the association include the handling of special exhibits and shows for the public, tying in with national campaigns, promotion of local special campaigns, promotion of adequate wiring and electric kitchens in new homes, fostering high standards of business and of advertising, coordination of merchandising policy, encouragement of the sale of safe products, encouragement of proper codes and laws to protect the public, meetings betwen groups on matters of mutual interest, information exchange and keeping the members posted on important developments, coordination of dates of distributors' and dealers' meetings, assistance to dealers in reduction of salesmen turnover and poor selling tactics.



Intermountain Association hears FHA Director Weggeland discuss housing need

Intermountain Electrical Assn.

Reactivated under a new name which expresses the broader scope of its operations, the Electrical League of Utah is enlarging and growing again from its wartime operations base under its new title, Intermountain Electrical Assn. Of its program and activities, Elias Strong, who has returned as its manager after four years as secretary to Governor Maw of Utah, says:

"Our association is extremely desirous of sponsoring a lighting institute and a modern home exhibit this year. Both of these projects, through necessity, must be held in abeyance due to the lack of display materials and the uncertainty of delivery. We do hope we can proceed with them some time this year.

"We have not had a lighting school in this area since the one which the Electrical League of Utah sponsored in June 1940 and it is felt that there is considerable need for bringing the electrical people up to date on the changes that have taken place in lighting since then. A special lighting institute committee is now studying the feasibility of staging this project this spring. They should reach a decision within the next 30 days.

"Our association is now in the process of expanding its scope of operation. Chapters have been formed in Ogden, Temonton, and Brigham City, Utah. We will shortly have representation in the Provo and Richfield areas. Later on it is planned that we will enter the southern Idaho territory.

"The Ogden chapter held its election of officers Friday, Jan. 11. Elected to serve were Jim Underwood, president; Albert Boyle, vice-president; George Herrod, delegate on the Intermountain Electrical Assn. board of directors; A. N. Vendell, secretary and treasurer.

"The annual meeting of the Intermountain Electrical Assn. will be held in Salt Lake City on Jan. 23. Results will be announced then.

"Our association membership is constantly increasing and we already have surpassed the former record of our predecessor, the Electrical League of Utah. I find industry members much more association minded than before the war and, if this trend continues, our association will be much more representative than it has ever been in the past."

ELECTRICAL WEST
Sales Guide

FOR THE ELECTRICAL MERCHANT OF THE WEST © FEBRUARY, 1946

Sheriff, Keep Away from that Door!

ORDINARILY, the thing a dealer likes best is selling. It's what brings in the money. It's fun. It has a kick to it. And it's what a man is in business for.

Every business, though, like anything else in life, has its chores. A business has to be **run**. It has to be steered around obstacles. It has to be slowed down for the dangerous curves, or the traffic lights; given extra push on the accelerator or shift of gears when the climb is steep. It needs to be kept under **control.**

These are particularly difficult roads right now. There isn't enough to sell. The costs of keeping the door open are up. The profit margin is down. It takes more skill to navigate a business today than it ever did, and it always took plenty.

What is said here may seem pretty elementary to the old timers. No harm refreshing on these points though. Even the best of us sometimes forget the multiplication table and need to freshen up on it occasionally. What better time than now to do it, waiting for something to sell?

In a very excellent guide for dealers called "Systemeering", Landers, Frary & Clark, makers of Universal appliances, remind briefly that to run a retail business profitably you must: (1) **buy** intelligently, (2) **sell** effectively, (3) **operate** efficiently.

Defining **operating,** it lists (1) **maintaining records** and proper equipment for efficient operation of every phase of buying and selling; (2) keeping good **personnel records** so that you know which of your employees are efficient or not, and why; (3) **controlling store expenses** by wise planning and careful budgeting so that pay roll, rent, advertising, supplies, services, can be kept in line; (4) **protecting** your customers, employees and your investment.

"Systemeering" further reminds that adequate records are the foundation of business control. For, in addition to their value in buying, selling and operating, Uncle Sam requires them for income tax purposes, the state or province may require them for sales or income tax purposes, your banker may want a look at them when you want a loan, you need them in case of fire to establish loss.

By far the most important reason is that adequate records are like navigating instruments, or like gauges and meters to the engineer. They answer your question every day, "How'm I doing?"

There is not space here to detail what

this excellent operating guide recommends. It was prepared in consultation with Burroughs Adding Machine Co., Moore Business Forms, and Shaw-Walker. Copies may be obtained from Universal.

Several other books and pamphlets are recommended to the man who has just started in business for himself or desires to do so. O. Fred Rost, editor of "Wholesalers Salesman", and well known merchandising consultant, has just written a little book, "Going Into Business for Yourself." (McGraw-Hill Book Co.) Dun & Bradstreet, Inc., which really has the low-down on business success or failure, has a booklet, "Opportunities in Retail Trade for Service Men." "Printers Ink" magazine has reprinted two excellent articles under the title, "Guide to Service Men and Others Who Want a Business of Their Own."

In the Rost book's appendix each of the types of retail business is listed and specific advice on each is given. An interesting and significant rating of the chance of success in each field is placed at the beginning of each of the chapters. The "Optimist Odds" for success in both appliances and radio are given as 10 to 1. These are the lowest ratings. Furniture gets a 15 to 1 rating, hardware 20 to 1, giftwares 25 to 1, groceries 30 to 1, and groceries and meat combined, 35 to 1. These odds are in themselves a warning that the appliance and radio businesses must be run skillfully if they are to succeed.

All a bookkeeping system does, however, is to furnish facts regarding the state of the business. A man needs some guideposts, some standard measurements for a successful business, against which to compare his own figures and facts. With these he can tell when he is on or off the beam, when it is wise to put more steam into selling or when to apply the brakes to some expense.

The figures, in percentages, in the box at the right, are some compiled by Dun & Bradstreet in 1939, a fairly normal year, and are probably as good a guide as is available. They were used in the Leo J. Meyerberg Co. mimeographed pamphlet from which other figures on the capital needed for operating an appliance business were quoted last month. Rost also quotes them in this book as typical for an appliance business, and for a strictly radio business quotes slightly different percentages, evidently from other Dun & Bradstreet surveys. For a radio shop he quotes, as percentage for cost of goods sold, 54.4%; rent or occupancy 4.6%; salaries to owners 16.5%; wages to employees' 8.8%; advertising 2.0%; bad debt losses 0.7%; all other expenses 6.2%. The successful radio business had at least a 6.8% net profit; operated on a 45.6% average gross margin on sales and had a stock turnover of 4.3 times per year.

It is true that no two stores are alike in respect to many conditions and that those whose businesses include other lines than just radio and appliances would have other percentages than these. It is very obvious that the gross margin obtainable from the merchandise sets the limits for other expenses. Note that the successful concerns bought and handled merchandise that would yield an average gross margin of 37.4%; the average concern derived a 35.3% margin; the unprofitable ones 31.9%.

Remember too that these were 1939 figures, before OPA transferred some of the manufacturers' extra costs on down the line to be absorbed by the distributors and dealers in reduced margin. Today a dealer will have to buy very carefully and sell without markdown or discount or trade-in to realize an average 35% margin on sales. There are fewer long discount items in the appliance line than there used to be.

In setting price ceilings OPA based them on the operating costs of the **most efficient** retail operators, so

Retailer's Operating Cost Survey
Radio and Electric Appliance Stores

(Based on Survey of 391 Concerns)

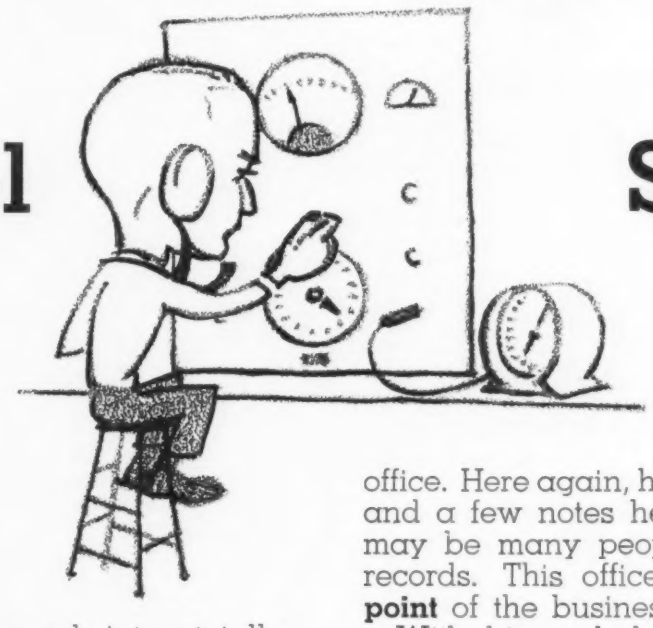
Profit and loss statement (In percentages of net sales)	All concerns	Profitable concerns	Unprofitable concerns
1. Net sales	100.0%	100.0%	100.0%
2. Cost of goods sold	64.7	62.6	68.1
3. Total expense	32.8	30.4	37.4
(a) Salaries, owners & offices	10.1	9.5	10.5
(b) Wages all other employees	10.7	9.7	13.0
(c) Occupancy expense	3.5	3.1	4.0
(d) Advertising	1.5	1.2	1.6
(e) Bad debt losses	0.5	0.5	0.6
(f) All other expenses	6.5	6.4	7.7
4. Profit or loss—(*)—loss	2.5	7.0	5.5(*)
Merchandise ratios			
5. Gross margin (% of sales)	35.3	37.4	31.9
6. Realized mark-up (% of cost)	54.6	59.8	46.9
7. Inventory turnover (times per year	4.6	4.9	4.3

that to make a profit on such margins you will need to be **equally efficient.**

As one experienced old timer in Fresno told us, a dealer can afford to make **fewer mistakes** these days. There is a premium on merchandising **know-how.** Observing conditions today he said that his advice to dealers would be to watch all expense, not pay excessive rent, buy too many and too expensive fixtures and equipment. Labor to get anything done is high and materials hard to get.

The appliance business, he said from experience, is easy to get into, but hard to operate skilfully. It has glamor and appeal, but it requires a lot of follow-up service.

The Control Station



Second of a series of good sense articles on business management

by Ken Hampton

TRADING, buying and selling is business, Something is purchased—changed in some manner, either by being made into a totally different form through manufacturing processes, or moved from one place to another for use or sale in the same form and sold again. Buymanship and salesmanship go on constantly in all business.

When one person, or a group of people decide to engage in this process called business, they go through certain steps which it is well to understand before we proceed with our discussion on merchandising.

First, they gather together an amount of cash. Before there can be cash available to them, some one or several people must have spent less money than they received. Thus, all business starts as the result of thrift and saving.

For the sake of this discussion, we shall speak of the owner of the business as an individual. Please don't let the terminology mislead you, because the ownership may be and often is invested in many individuals gathered together in a corporation or partnership. But, regardless of wherein the ownership lies, the principles we are explaining remain fundamentally true.

The owner then sets up some kind of control over his cash. He probably deposits it in a bank and keeps a record book. For this discussion, we will call this control his office. Here again, his office may be a bank and a few notes he makes himself—or it may be many people keeping elaborate records. This office becomes the **control point** of the business.

With his cash he then buys supplies. These supplies, either raw materials or finished goods, then become his inventory. He now has some of his cash in goods, so his control office has both cash and materials to watch and account for now.

The owner then provides space for these materials. This space becomes his store or factory.

His next problem is to turn these materials back into cash at a profit to himself. To accomplish this, he hires an organization and equips them with the necessary tools with which to work. Since this is to be a discussion of merchandising, we will call this the merchandising organization. They are charged with the function of turning the owners' goods into cash at a profit to him.

In carrying out their assignment, they often find that the people who want to buy the merchandise cannot pay cash for it but will promise to pay for their purchases at some later time. This custom gives rise to accounts or promises to pay sometime in the future. These are known as accounts receivable. These the merchandising organization tenders to the owners' control office, and, if acceptable to them, come under their control, to be turned into cash at a later date. When this happens, the

control office has added a new problem to its guardianship of the owners' assets. It now must guard, account for and collect some promises-to-pay from several sources often remote from headquarters' location.

Here in chart form is shown this cyclical process that is the complete functioning of any business.

CASH

OFFICE — INVENTORY — OWNER

MERCHANDISING ORGANIZATION

ACCOUNTS RECEIVABLE

CASH

An owner takes his cash savings, buys some materials, changes this material in some way, sells it for cash or accounts receivable which he turns into cash. If he goes through this operation profitably, he is successful—if not, he is soon replaced by someone who is successful, for all business must operate profitably to survive.

The organization he uses to carry on this work divides naturally into a **control organization,** generally called his office, which becomes guardian of all the property, whether cash, inventory, accounts receivable, real estate or personal property—guards it and accounts for it to the owner —and a **producing organization.** This producing organization falls naturally into further divisions of sales or distribution activities and manufacturing functions. Above all, of course, is ownership which is responsible for guidance and administration.

The above explanation, of course, is extremely simplified, but its thorough understanding is necessary as a basis from which to judge any explanation of a business.

We set it down here to refresh your mind before we proceed with specific comments.

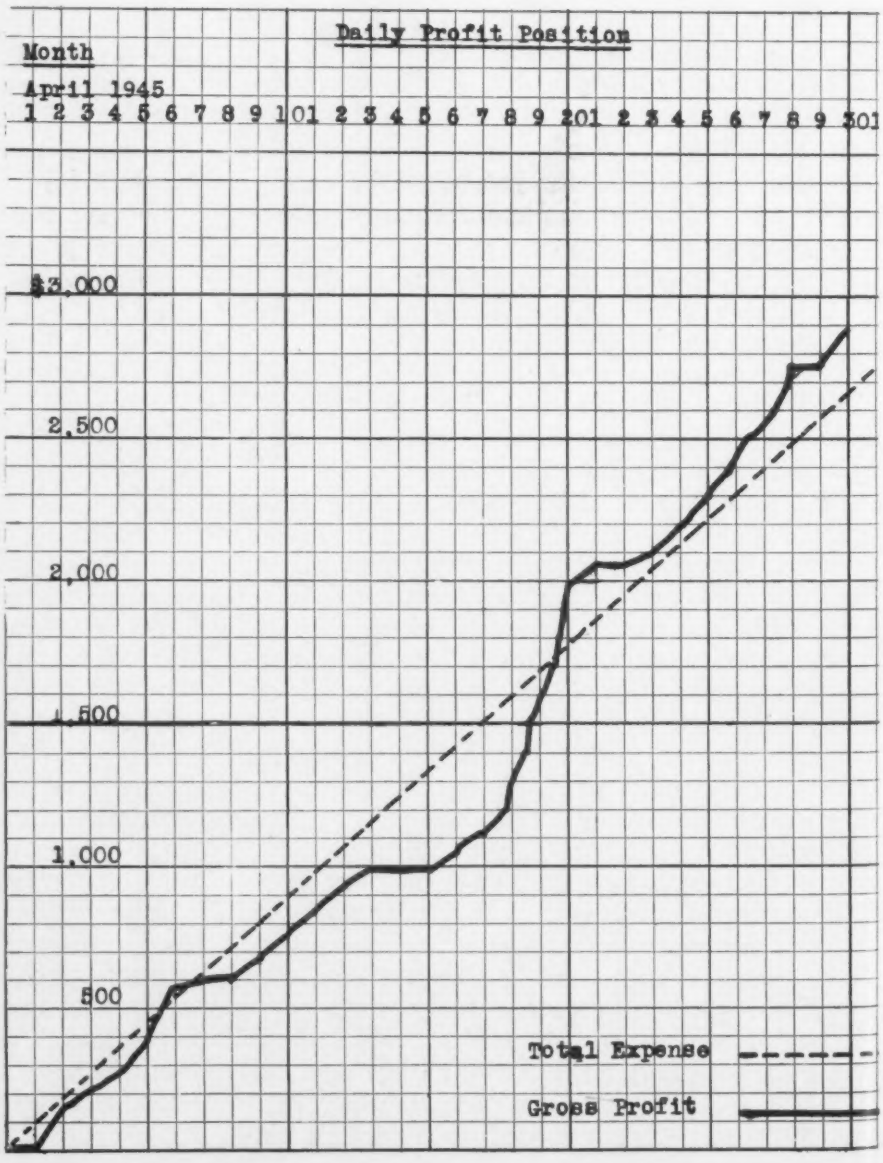
A "Speedometer" of Business Motion

Keep above the dotted line!

One of the simplest ways for a dealer to keep a day-to-day control on his business is to use a simple graphic chart like that at the right. It is a sort of meter to look at every day and see if he is keeping ahead of the wolf. According to Ken Hampton, it is an actual case.

This dealer's total cost of operation, as well as he could predict it from his fixed and current expenses, ran about $2,650. The dotted line drawn across the lines for each day represents the proportion of that total expense for each day.

Every day's gross intake or profit was then plotted against the dotted line. Note how intake lagged until about the 18th when he put on extra effort, sold more and came out a little to the good at the end of the month. By watching this "speedometer," he was able to put on more pressure



Where to Sell Lamps; Lighting Fixtures

Results of Sylvania surveys of commercial and residential users shows who will buy, what kind, for what reasons and from whom

NATIONAL surveys sometimes do not reflect accurately the regional or local situation. Yet comparison of percentages, in local summaries for most of the Western cities from which survey figures were obtained, to those for the United States as a whole are so close, declares George R. Sommers, Pacific Coast sales manager for Sylvania Electric Products, Inc., that his quotas and program of sales has been built on them. Cross checked against last year's sales they still remain relatively accurate. Therefore the information derived from the continuing national surveys conducted by his company, he feels, hold significance for dealers in lamps, contractors who install lighting, wholesalers who distribute and makers of lamps and fixtures for this Western market.

The dealer or contractor can apply these percentages to his own home town market and be as near right as it is practical to be without a door to door survey.

Sylvania's surveys, directed by Frank Mansfield, its director of research, were made by an independent survey agency for Sylvania in cities of 2,000 and over from coast to coast. That company's purpose was to determine the market for fluorescent lamps and fixtures and the most popular channels of distribution. Making them public through ELECTRICAL WEST gives the entire industry the benefit of this expensive and extensive research job. To fit them to each dealer's own program takes only the application of the percentages to his own local market in commercial and residential customers of the local utility.

Of the 4,259,000 commercial electric meters and 30,000,000 residential meters in the United States, the 11 Western states have 600,000 commercial and about 4,000,000 residential meters. For figures of those for individual Western utilities see previous pages.

Particularly interesting is that not more than 10% of the commercial customers have yet been converted to fluorescent, yet all but 5% of the non-users think it has advantages over incandescent. Three out of 10 non-users do not know enough about fluorescent to decide and 85% of those who already have it initiated the purchase themselves. Owners of 22% of the establishments surveyed expect to install fluorescent lamps and fixtures. A third said they would continue to use incandescent and 46% were undecided about changing.

In the home lighting surveys it was found that only one out of every ten homes have any fluorescent lighting at present but of these half plan to use more. Old and new customers indicate that the kitchen will be the first place to be fluorescent lighted, the bathroom and bedroom next. Both groups hope eventually to have it in all rooms, a majority planning on permanent fixtures.

Because the figures and percentages themselves are so eloquent, they are selected and presented in the following, the commercial survey conclusions first, the residential next.

Commercial Lighting Market

The commercial lighting market comprises retail outlets, service establishments, wholesalers and miscellaneous. They represent a great and to a large extent still unexplored market for fixtures, lamps, both fluorescent and incandescent and additional wiring. What kind of lighting do they have now?

Retail establishments

Type	Percent of all stores—Incandescent only	Fluorescent only	Both
Food stores	68.3	1.1	30.4
General Merchandise	50.0	4.3	45.7
Apparel	40.8	3.8	55.4
Furniture	52.7	.6	46.7
Automotive	43.4	2.3	54.3
Filling stations	81.3	None	18.7
Building materials	58.9	2.3	38.8
Hardware	62.2	2.4	35.4
Variety	63.3	None	36.7
Eating places	59.7	2.7	37.2
Drinking places	54.8	1.1	44.6
Drug stores	31.1	4.7	64.2
Liquor stores	45.4	21.2	33.4
All others	48.0	3.9	47.7
Service establishments			
Barber & beauty shops.	75.9	2.3	21.8
Business service	59.7	4.0	36.3
All other services	57.3	4.2	38.5
Other establishments			
Theaters	53.1	1.6	45.3
Hotels	62.5	None	37.5
Banks	39.7	1.6	58.7
Professions and offices.	78.8	2.2	18.9
Buildings	82.2	None	16.8
Hospitals	49.3	None	50.7
Churches	87.8	None	12.2

Are the non-users familiar with fluorescent?
(They represent 59% of all establishments)
Familiar with fluorescent..... 69.3%
Not familiar 30.7%
Three out of 10 non-users of fluorescent lighting do not know enough about the subject to decide intelligently upon the question of its use.

Only 2.2% of the offices are yet fluorescent lighted, as is this one of the Pearl Assurance Co. Ltd., San Francisco

Fluorescent in the kitchen, shown at the Sylvania Lighting Center in New York

Of non-users (those having opinions)
Only 4.8% think fluorescent lighting has no advantages
35.3% say it is brighter
32.3% say it is economical
12.1% say it is more attractive
10.1% say it is "easy on the eyes"
24.9% give 5 other reasons
11.7% don't know—no answer
(Total is more than 100% since some expressed more than one opinion.)

Of present users
85.5% had fluorescent installed themselves
14.0% found it on premises

What influenced present users to install fluorescent?
44.8%—better light
38.2%—more economical
19.8%—up-to-date—attractive
14.5%—easy on the eyes
7.5%—greater spread of light
18.4%—all other reasons
4.3%—no answer—don't know
(Total is more than 100% since some gave more than one reason)

"It is interesting to note," Sommers declared, "that only 5% of these people installed fluorescent lighting for the most obvious reason—to help sell their merchandise. This fact alone indicates an urgent need for real salesmanship on the part of lighting salesmen."

Majority Installed Themselves

The survey further revealed that of the present users, only 14% found it on the premises when they rented or bought commercial space and the remainder installed fluorescent lighting themselves. Of the latter group only a few were influenced by salesmen to install fluorescent fixtures and the rest had to seek out salesmen from whom to purchase the equipment.

How are fluorescent purchases initiated?
Of all establishments—

Ideas sold by sales	13.0%
Buyer initiated purchase	84.7%
Don't know	2.3%

Commercial customers are a fertile field for **real** salesmanship.

Change to fluorescent usually not dependent upon other plans for changes or alterations

Alterations made in connection with fluorescent installations

None	60.7%
New layout	16.6%
Redecoration	11.4%
New equipment	7.8%
New building	1.9%
Other alterations	1.0%
Don't know	0.6%
	100.0%

Fluorescent Fixtures Purchased From Wholesaler

The electrical wholesaler sold fluorescent fixtures to one out of every three purchasers, with the electrical retailer and electrical contractor getting all but 16% of the remainder of the business. More installations of fixtures were made by electrical contractors than by any other group.

Where are fluorescent fixtures purchased?
Of those interviewed:

Electrical wholesaler	29.8%
Electrical retailer	27.8%
Electrical contractor	27.2%
All others	10.1%
Don't know—no answer	5.7%
	100.0%

Who installs fluorescent fixtures?
Of those interviewed:

Electrical contractor	32.7%
Electrician	22.7%
Electrical retailer	16.7%
Owner or employee	11.7%
Electrical wholesaler	7.0%
All others	3.9%
Don't know	5.3%
	100.0%

Do fluorescent users think they have better light?

77.9%	say "yes"
2.3%	say "no"
.7%	say "about the same."
And—	
77.3%	say "fluorescent's more attractive"
Only 3.7%	say "less attractive"

Most users find fluorescent lighting satisfactory

Entirely satisfactory	76.7%
Fairly satisfactory	18.4%
Unsatisfactory	4.8%

Find Fluorescent Satisfactory

Of those establishments where the newer lighting source was installed, less than one out of four owners found any fault at all with fluorescent fixtures, and less than one in twenty considered fluorescent lighting entirely unsatisfactory. "Most of this dissatisfaction," said Sommers, "is due to the wartime shortage of lighting servicemen and to the electrical contractors neglect in selling maintenance contracts.

"Actually, we were surprised to find the percentage this low, considering that fluorescent lighting is only seven years old. Also, most of the fixtures were installed when fluorescent was in existence less than two years, and before the research of the larger companies was directed toward the improvement of design and operation."

What are the reasons for dissatisfaction with fluorescent?

	% of dissatisfied	% of total users
Mechanical defects and difficulties in replacement	43.9	10.1
Flicker	17.3	4.0
Distorts color	11.7	2.8
Slow starting	10.1	2.3
Too expensive	6.1	1.5

But less than 1 in 5 finds fluorescent partly unsatisfactory.
And less than 1 in 20 finds it entirely unsatisfactory.

Few Have Spare Bulbs

Only one out of every four commercial users who do not sell light bulbs to the public have spare bulbs on hand for their own use, and this applies to establishments where either incandescent or fluorescent lighting is installed.

How many spare incandescent bulbs do commercial users have on hand?

25.4%	have none
43.2%	have 12 or less
17.5%	have 12 to 48
Only 12.9%	have more than 48

for all commercial outlets

How many spare fluorescent lamps do users have on hand?

None	27.5%
1-3	14.1%
4-6	19.2%
7-12	18.1%
Over 12	20.6%

of all outlets using fluorescent lighting

Buy Bulbs From Many Sources

A glance at the source of bulb purchases shows the wide range of outlets

Some fluorescent applications in the living rooms were demonstrated also

serving such commercial establishments, with the retailer the leading supplier. However, in every instance, the wholesaler is more of a factor in the sale of fluorescent lamps than he is in the sale of incandescent bulbs. "The reason for this situation," said Sommers, "is that fluorescent lighting installations have been made in the larger, more progressive kind of firms which would normally do business through wholesale channels."

About two-thirds of the bulb retailers get their supply of incandescent and fluorescent lamps from wholesalers, and electrical wholesalers are their biggest single source of supply.

Convenience Influences Purchase

Convenience was the major reason given for patronizing present sources of supply, and this, according to Sommers, indicates that most businessmen tend to go around the corner or across the street to neighborhood stores for their bulb purchases.

Why do non-sellers buy bulbs from present source?

	Incandescent	Fluorescent
Convenience	55.9%	37.0%
Price	12.1	14.9
Reciprocity	10.3	9.8
Buys other supplies	7.5	13.6
5 other reasons, total	...	17.4
Don't know	6.7	10.6

How many will install fluorescent postwar?

Of those interviewed:

	%
Expect to install	21.7
Will not	31.6
Undecided	46.5

Plenty of room remains for a good sales job.

Reasons given by commercial outlets definitely NOT planning to install fluorescent lighting

Has enough light	51.3%
Unsuitable (fluor.)	9.5%
Establishment is rented	5.9%
Address or business will change....	4.8%
Price	4.7%
Fluorescent has proved unsatisfactory	2.8%
Color undesirable	2.3%
Quality of fluorescent light undesirable	2.3%
All other answers.....	5.2%
Don't know—no answer	12.8%

The above group represents less than 1/3 of all commercial installations.

"From the jobber's viewpoint the big problem in getting to this market is profit engineering," Sommers suggested, "although the lamp and fixture sales potential and the power potential for utility companies is tremendous, the market is spread all over the map. Moreover, it is probable that 75% of the volume of business would go to accounts that would buy less than $25 worth of lamps a year. However, it is our prediction that despite such drawbacks, some jobber or wholesaler is going to do a sound job of coverage in selling lamps and fixtures to these people. The market is there and somebody is going to find a way to make it profitable."

Home Lighting Survey

Results of the Sylvania home lighting survey made earlier have already been told but in order to make them handy and available to the lighting man, the dealer and wholesaler, the salient points are repeated in the following tables. The survey was made by sampling in large, medium and small cities and country towns as well as some farms. These samplings were taken from all parts of the country in such a way as to get representative geographical distribution, type of home and economic group, according to Sommers.

Who is the chief buyer of light bulbs?

There are 36,000,000 families in the United States.

In 61.3 of these families the housewife is the chief buyer of light bulbs. (In rural communities, and in the larger cities the percentage is lower—55.5% and 56.5%)

In 32.5% of the homes the husband buys the bulbs.

7.0% of the bulbs are bought by other members of the family.

People outside of the family account for 1.6% and servants for .5% of the remaining purchasers.

In rural areas under 2,500 the wife makes 56.5% of the lamp purchases and the husband 46.7%.

Where do they shop when they buy light bulbs?

	Present source	Preferred source
Grocery store	40.6	35.6
Variety store	21.1	11.0
Hardware store	19.2	12.9
Public utility	17.2	14.3
Drug store	14.3	10.2
Electrical store	12.9	9.7

More people would like to buy bulbs in a grocery store than any other type of outlet in the preferred group, although the public utility and the hardware store rank ahead of the variety store in the purchaser's preference.

(Many gave more than one answer. Therefore, the total is more than 100%.)

How many bulbs do they buy at a time?

From 2 to 6 bulbs were last purchased by 64.2% of those interviewed. 23% bought more than 6 and 12.8 bought only 1.

Number of bulbs last purchased	
1	12.8
2	20.6
3	12.4
4	10.9
5	2.6
6	17.7
7-11	3.5
12	7.6
Over 12	3.8
Don't know	8.1

In cities of 1,000,000 and over 11.3% bought 12 at their last purchase.

Over half (53.2%) of those buying more than 1 at a time bought assorted sizes.

How often do they buy?

Twice a year is the most common rate of purchase.

Less than once a year	3.9
Once a year	16.2
Twice a year	27.1
Three times a year	19.5
Four, five and six times a year	15.4
Over six times	2.3
Buy as needed	6.1
Don't know—other answers	9.5

What do people ask for when they want an "incandescent lamp"?

For many years the lighting industry has used the term "incandescent lamp." The public, however, does not agree with this terminology. When they go out to buy they call them:

"A light bulb"	25.6
"An electric light bulb"	23.1
"A bulb"	17.4
"An electric bulb"	11.4

In all over twenty names are used. Over 95.7 use the word "bulb"; only 2.4% used the word "lamp."

Do buyers of light bulbs prefer any particular brand?

There is little demand for any one brand of incandescent bulbs.

Most buyers will gladly accept any recognized brand offered for sale.

Wartime brand shortages have brought realization that the lamp industry makes good light bulbs.

Merchandising is the key to further brand sales.

Number of empty sockets per home.

The average number of sockets per home is 22 of which 1.6 are empty.

The use of lamps (portable sockets) is more prevalent in the larger cities. Among the homes inventoried, the proportion of portable to fixed sockets declines steadily as the city becomes smaller.

Do they have spare bulbs on hand?

Less than half of the people interviewed had any spare bulbs on hand—43.0%.

In the largest cities 46.0% have some extra bulbs.

40.3% in cities from 250,000 to 999,999.

46.1% in cities from 25,000 to 249,999.

38.3% in the rural communities.

Among those who own homes 50.7 had spares; of those who rent 35.5% reported bulbs on hand.

Over half of those who had spare bulbs have less than 6.

2 bulbs per home were reported by 26.7%, the largest group.

What determines the market for fluorescent light?

Fluorescent lighting was found in use in 9.2% of all the homes called on. Fluorescent sales are in direct relation to living standards in all related tables.

Income group A—26.5 have fluorescent
B—13.2 have fluorescent
C— 9.0 have fluorescent
D— 2.8 have fluorescent
E— 0.0

Home ownership is also an influence. 13.4% of the home owners have fluorescent lighting as compared to 5.2% of those who rent.

This same trend was indicated in the other groupings such as:

1. Number of rooms in house
2. Rent paid
3. Value of home
4. Acreage of farm

Fluorescent lighting is satisfactory

Fluorescent lighting is entirely satisfactory to 79.1% of those who have it and here are the reasons they gave:

Easier on the eyes	18.0%

Cheaper to operate	15.4
Spreads even light over a larger area, no shadows	13.0
Better light, more light	12.7
Softer light, less glare	12.5
More like daylight	8.7
Brighter than ordinary light	7.2
Better for public places on special purposes	4.3
More attractive, more cheerful	3.7
All other advantages	1.9
Don't know, no answer, no advantages	34.7

What are the disadvantages of fluorescent lighting?

Only 1 person in 5 (20.9%) of the people objected to fluorescent lighting, giving the following reasons:

Unattractive fixtures	8.6%
Too brilliant, glaring	6.9
Slow to light	4.6
Difficult or expensive replacement	3.6
Hard on the eyes	3.5
Don't like the color	2.8
Too functional for home use	2.7
Too dim (no concentration)	2.1
Flickers	2.1
All others	6.1

63.3 of those who objected had no answer or could think of no disadvantage.

Many gave more than one answer. Therefore, the total is more than 100%.

What are the prospects after the war for fluorescent lighting?

Nearly half (45.7%) of those who now have fluorescent lighting plan to have more after the war.

30.4% plan kitchen installations (43.8 already have it)
24.6% will install in the bathroom
15.2% will install in the living room
8.0% in the bedroom

Among those who now have no fluorescent
64.4% plan kitchen installation
14.2% plan living room installation
9.1% plan bathroom installation
1.9% plan bedroom installation

Where do they purchase fluorescent?

Both tubes and fixtures are usually bought in an electrical store by those who have fluorescent lighting.

Lamps

Electrical store	24.8
Public utility	8.3
Hardware store	5.6
Electrical contractor	4.6

Appliance and department stores were mentioned by 3.0% of the people and 1.3% bought by mail order.

No replacement lamps have been purchased as yet by 44.4% of the users.

Fixtures

40.7 from the electrical store
7.0 from the contractor
6.0 from the hardware store
5.6 from department store
5.6 from mail order
3.3 each—public utility and appliance store
2.0 each—furniture and grocery store

Where will they buy fluorescent lighting after the war?

Permanent fixtures will be installed by 58.7% of those planning additional units and 56.2% who plan to install their first fluorescent fixture.

Where will they buy them?

	Present users	New users
Electrical store	41.3	42.0
Public utility	14.5	28.5
Electrical contractor	8.0	9.9
Electrician	6.5	0

Knowledge of fluorescent lighting

Out of almost 3,000 people interviewed 2,049 or 68.9% had heard of fluorescent lighting. 31.1% say they had not. In rural communities 38.9% had not heard of fluorescent lighting. 42.5% of the foreign born and 14.4% of the colored claim never to have heard of it.

By Teletype

From Our New York Representative

Highlights on Chicago Appliance Shows—The term "buyers" for those who visited Palmer House, Furniture and Merchandise Marts, was misnomer because there was little for sale. Two-thirds were wholesalers looking for lines or trying to cajole deliveries, both fruitless tasks . . . Rittenhouse had big play on newly engineered chime line . . . Proctor's new range unit and Samson-United's packaging innovations attracted crowds . . . New automatics, shown for first time were, Blackstone and 1900, both agitator type . . . Apex's automatic, shown to press only, employs new principles in such machines, including figure-8 washing action in basket . . . More gas ranges shown than in previous shows. This also true of kitchen cabinets and sinks . . . On radio, Zenith's exhibit probably attracted most attention, stressing new design and new Cobra tone arm. Outstanding feature was showing of 4-tube sets in $10 range—much earlier than most people expected these to appear. May presage earlier competitive fight. RCA reported to be making sets in same price range for Woolworth . . . W. T. Grant stores were previously reported planning to sell low-priced radios.

Manufacturers of major lines—G-E, Westinghouse, Frigidaire, etc.—re-established snazzy permanent exhibits at Furniture Mart, but showed little new stuff.

That Peralta Co., mfgrs. of waterproofing material praised in Readers Digest, owned by Milt and Ed Schreyer, who developed Steam-o-Matic iron . . . The Sanford brothers, Dave & Fred, now distribute nationally the Reynolds pen, currently receiving wide promotion.

Noma Electric really putting together a line. In addition to Estate stove, recently purchased, have just bought Refrigeration Corp. of America, said to be dickering for other firms . . . Federal Tel. & Radio, new entrant in radio set field, won't stop there.

● A NEW APPLIANCE store, Rodins, Inc., 1152 Seventh Ave., San Diego, was opened recently under the dual managership of Raymond Lowitz and Bernard Horrow, both formerly in the appliance industry in Chicago. The store has been designed solely for appliance display and sales, and will handle the complete Westinghouse line and Emerson, Admiral, Westinghouse and Zenith radios. A record department, with shelf space for 10,000 records, and six comfortable listening posts, has been provided and all major record lines will be handled.

● THE HAROLD W. BURT Radio Electronic, 4162-64 Park Blvd., San Diego, is operating a "display car," which makes a weekly visit to all of the radio dealers in San Diego County. Arranged in a series of display drawers is a complete supply of tubes, wire, coils, crystals and pick-ups, panel lamps, line cords, sockets, soldering irons, recording blanks, needles, all types of condensers, small hardware, and other items needed by radio repairmen. Salesman John S. Newberry, formerly with Stewart-Warner in Texas, mans the car, and "on-the-spot-deliveries" are finding ready acceptance by radio repairmen, according to both Newberry and Burt. Featured in Burt's store itself are technical books covering all phases of radio repair which are available to radio technicians, and his entire stock is kept on shelves and display counters which make it easily accessible to dealers.

Oldtimer Retires

Harry B. Rogers, manager of the General Electric Supply Corporation, S. 122 Monroe, Spokane, has announced his retirement effective Dec. 31, 1945. He will remain for one year as consultant to the new management, retiring on a company pension Dec. 31, 1946.

One Jan. 1, 1946, Edmund Z. Coman will be promoted to branch manager and he will become manager when Rogers is retired. N. E. Shields will become supplies sales manager.

Rogers, who has been active for years in the Northwest Electric Light & Power Assn., is well known throughout the northwest's electrical industry. He has been connected with the company for the past 32 years, 26 of which have been in Spokane. He indicates that the company plans extensive expansion of the Spokane office during the coming year.

Flashbacks to the Dave Harris McGraw Award Presentation

Dave Harris, left, receives the McGraw Medal for Cooperation, presented by George C. Tenney

Clockwise, beginning at right, among those present to pay their respects and honor were James Galvin, San Francisco contractors' president, Henry Lenninger, East Bay Electric Club president, and Ken Ryals, PCEA president. Chairman of the meeting A. Emory Wishon, keynoter Paul Cadman and distinguished expatriate E. O. Shreve. A typical table of old friends in the industry. Board of directors of the Northern California Chapter, NECA table. Ben Tassie, Mike Rhine of G-E, San Francisco, A. C. McMicken, PGE, and Sam Gates, G-E, Los Angeles

Contractors Reorganize NECA Chapters

Sacramento starts chapter, Northern California group divides; San Francisco protests pensions

SOME simplification of the rather complicated and overlapping association groupings in the electrical contracting industry in northern California was effected during January, although the entire ball of yarn is not untangled as yet. To the former Electrical Contractors and Dealers Assn. of Sacramento was released all territory in the Sacramento Valley for the formation of a new National Electrical Contractors Assn. chapter. The San Francisco Chapter was likewise relieved of its implied obligation to remain members of the Northern California Chapter by the latter, at its annual meeting in Oakland, Jan. 29. The Northern California Chapter then offered the remainder of its territory and membership to the Alameda-Contra Costa County Electrical Contractors Assn., with a suggested plan to merge and form a new chapter with Oakland as its center.

At the end of the meeting, committees from both organizations were to study the feasibility of such a plan.

George Seaman, supervisor of field service for NECA, spent three weeks in California assisting in the unscrambling of the overlapping groups. He also introduced the newly appointed Western field representative for NECA, Al Martin, a Seattle man who has had considerable labor and employment experience and who may make his headquarters in Oakland.

The newly formed Sacramento Valley Chapter changed its name and enlarged its scope at its annual meeting in Sacramento, Jan. 25. Its territory will coincide with that in the jurisdiction of Local 340, IBEW, with which it is the bargaining agency for contractor employers.

Officers elected were E. J. Cotter, Reliable Electric Co., president; J. D. O'Connor, Lupen & Hawley Co., vice-president; J. W. Thomas, secretary; F. R. Merwin, Merwin & Gatejin, treasurer, and George C. Foss, C. S. Donley, Sterling Electric Co., and Ed Wilmunder, directors. William Welsh is the business manager of the chapter, as he has been of its predecessor for many years. J. D. O'Connor, who has been a member of the board of governors of NECA from the Northern California Chapter, probably will be the governor for the new chapter in Sacramento.

With its San Francisco members and Sacramento members self eliminated, the directors of Northern California Chapter then elected Dan Bronson, California Electric Co., Oakland, as president; Carl Stolting, Santa Rosa, vice-president, and re-elected W. A. Cyr, ELECTRICAL WEST, secretary-treasurer. Ed Buttner, Scott - Buttner Co., Oakland, was elected governor for the chapter, succeeding O'Connor. A committee consisting of President Bronson, Lou Spott, Oakland, Wesley Evans, Salinas, and the secretary was named to investigate the feasibility of combining the Oakland association and the Northern California Chapter.

Status of the San Francisco Chapter and election of its officers was to be determined at a meeting Jan. 31, too late to be reported in this issue. James Galvin, president for the past year, was renominated without opposition, as were most of the other officers at the Jan. 3 meeting. The issue as to whether to remain a chapter of NECA flared up as a revolt from some members who objected vigorously to the NECA support of a contribution by contractors to the union's pension fund. In a nation-wide ballot on the proposal, the California chapters were all against it, but the issue carried by a small majority nationally and will be required of all contractors employing IBEW labor on a basis of 1% of labor pay roll. This action was hotly discussed at both the Northern California Chapter and San Francisco Chapter meetings. Action to drop from NECA was not brought to vote in San Francisco because of a technicality in by-laws which caused the decision to be postponed 60 days.

Los Angeles Chapter

Richard E. Arbogast, Newberry Electric Corp., Los Angeles, was elected president of the Los Angeles Chapter, National Electrical Contractors Assn., at its annual meeting, Jan. 4. succeeding A. L. Stone, who has been repeatedly re-elected to that office for many years. Stone was kept in harness, however, by being made treasurer, while Sid F. Hill, Hill Electric Co., was named vice-president. Warren Penn, manager of the chapter, acts as its secretary.

The executive committee of the chapter will consist of Arbogast, Hill, A. L. Stone, George Stone, R. F. Doll, J. B. Shamel, R. Max Fry, Harry Vancott, Howard Nicholas. Committee chairmen appointed were: C. D. Draucker, membership; C. J. Bennett, program and entertainment; Howard Nicholas, inspectors' conference; J. B. Shamel, labor relations; George Stone, apprenticeship training; G. E. Arbogast, legislative; Otto K. Olesen, industry and jobber relations; A. L. Stone, credit and accounting; R. R. Jones, construction employers' council; and J. B. Shamel, labor relations arbitration committee.

A special meeting was called Jan. 31, at which T. L. Rosenberg, Oakland, vice-president of NECA for division 6, George Seaman, field supervisor NECA, and Al Martin, newly appointed representative for division 6, were honored guests.

Wholesalers Meet

Its gatherings canceled during the past two years, the Pacific division, National Electrical Wholesalers Assn. will resume its customary spring meeting, not at Del Monte though, for it is still used by the Navy, but at Hotel Californian, Fresno, March 14-16, according to R. A. Balzari, secretary. In addition to its usual attributes, it will have a meeting of the new appliance section.

Members' business meetings will be held Thursday afternoon, and the appliance section will hold its business meeting that evening. Friday general meetings will be held at which other branches of the industry will be welcomed, and the Saturday morning session will feature the utility companies' report on their sales programs for the year. R. E. Fisher, vice-president, Pacific Gas and Electric Co., will be chairman of this feature, the appliance section, under Al Meyer, L. J. Meyberg Co., combining on the program to present views of a banker on conditional sales contracts, a wholesaler, and a manufacturer, in order to round out the distribution picture for those attending.

Ladies will be welcome, said Balzari, and the golf tournament that is traditional with such meetings will be held again.

Night traffic fatalities and the need for better street lighting to curb night traffic fatalities was stressed by W. H. Edman, Milwaukee, chairman IES street and highway lighting committee, at a meeting of the electric industry and traffic officials in Salt Lake City. Edman complimented Salt Lake City officials for splendid progress in maintaining effective street lighting.

Ogden Chapter Intermountain Electrical Assn. held its first annual Ladies' Night dinner last month, with President George Herrod presiding. A discussion of radar by Dr. H. T. Plumb was the program headliner.

Seeing is the Biggest Thing in Selling, color movie, was shown at the January meeting of the Southern California Section IES.

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Pictorial PCEA Panorama

PCEA PERSONALITIES at the recent conference. 1. President Ken Ryals introduces Atomizer L. M. Klauber. Jim Pollard, Joe Gumz and Henry Rice in front row seats. 2. Art Brown and "Kelly" Courtright. 3. Ike Borda, Hance Cleland, Harvey Searight and George Henderson in the tropics. 4. Lighting men Leonard Towner, Karl Koch and Stanley Scarfe. 5. Past presidents Ray Alvord and "Jack" Frost reminiscing. 6. Ralph Walbridge and "Kelly" Courtright when not in motion. 7. Part of the long registration line with Paul Suransky and pipe at center, Courtright steering things along, George Hawley almost eclipsed. 8. Poker pals Sam Gates and Hance Cleland warming up for a later tilt. 9. Administrative Services Chairman Forest Naylor and Vice-Chairman Leon Heseman get bearings from President Ken Ryals. Pictured by A. X. Schilling, PCEA Panorama correspondent for Electrical West.

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Its Own Medicine

New Portland building of General Electric Supply Corp. finds that its own lighting example helps it sell many installations

FIRST-CLASS lighting, an integral part of General Electric Supply Corp.'s new building in Portland, is already bringing the rewards to be expected by those who are on hand first with the most. Keen customer interest in the lighting installation has demonstrated its educational value and led to important sales. All this in addition to the equally direct benefits to the corporation in the form of effective product displays and fine working conditions.

G-E Supply showed sound strategy not only in lighting up but also in timing—entering 1946 and the impending period of modernization with a facility which demonstrates what 1946 lighting means.

The new building covers 60,000 sq. ft. at the corner of 14th and Everett St., Portland (Address: 300 NE 14th St.), consists of two stories plus basement, and incorporates sales, display, office and warehouse space.

Front-of-the-building parking space for counter customers is an important incidental, especially with the street-parking situation in Portland (as elsewhere) being what it is these days. The lighting job, by the way, extends to the parking space, which is flood lighted by U-818 Holophane fixtures, flush-mounted in the building walls.

General arrangement of the building is warehouse space on all floors to the rear, office and sales and display space to the front. Going in the front door, we enter the supply store. On the second floor front are the display room and demonstration stage on one side, the offices on the other, the number one office being that of S. S. Brundage, Portland manager. The second floor also accommodates the employee's room and air-conditioning equipment. The heating plant is in the basement.

The building is drawing about 100 kw. P. L. Norstrom, G-E Supply's lighting specialist, sets forth the following details as to how the lighting component of this load is disposed.

Sales Store

The area in front of the counter is 20x63 ft. with a ceiling height of 13 ft. Ceilings and walls are white. Installed are two rows of Day-Brite Viz-Aid suspension-mount fixtures. These are maintaining 40 ft.-candles.

Measurements of the broken-package room are 40x60 ft. with 13-ft. ceiling. The installation here consists of 4-tube, 40-watt, open type, individual-mount fluorescent fixtures for general illumination, supplemented by Holophane stock-bin lights for the bins, producing 30 ft.-candles. The parts department, measuring 34x20 ft. with 13-ft. ceiling, has a similar installation supplemented by Goodrich stock-bin lights; 25-ft. candles are being maintained.

Offices

The general office measures 86x58 ft. with 11-ft. ceiling. The ceiling is of accoustical block; the walls are pastel green. Set in the ceiling are flush troffers with 2-tube 40-watt units in continuous rows provided with Holophane wide-angle control lens. There are three rows 84 ft. long, two rows 64 ft. long, and four rows 72 ft. long. Intensity maintained at the working plane is 70 ft.-candles. For health protection, 14 germicidal units are evenly spaced on three walls.

The manager's office is 13x20 ft. with 11-ft. ceilings. Here again the ceiling is of accoustical block; side walls are beige. Lighting is of the same type as that in the general office but consists of two 16-ft. rows, which maintain 50 ft.-candles.

Separate from the main office, but with similar walls and ceiling, is the billing room, measuring 15x13 ft. Here, two 16-ft. rows of 2-light 40-watt open-type troffers maintain 55 ft.-candles at the working plane.

Display Room

Display room dimensions are 85x35 ft.; ceiling and walls are the same as the general office. Four rows of flush troffers with louvers run along 64 ft. of ceiling, employing 2-light 40-watt units. A 26x10-ft. space at the end of the display room forms the stage, which is lighted by a 24-ft. 2-light 40-watt troffer with louvers.

Warehouse Space

Basement: a 200x100-ft. space utilizing in the center aisle 2-light 100-watt industrial fixtures on 5-ft. spacings to form a continuous row. These units remain on throughout the working day to maintain general illumination; they provide 30 ft.-candles in the bay in which they are installed. In the other bays, 300-watt RLM reflectors are spaced on 10-ft. centers to produce 20-ft. candles.

First floor: installation and results are the same as in the basement side bays, except in the shipping and receiving office, which has individual 4-light 40-watt open-tube fixtures, suspension mounted, delivering 33 ft.-candles.

Top—Appliance display room; stage for model kitchens, laundry is at far end Center—General office space has highest illumination level: 70 ft.-candles Bottom—Counter sales store; facilities for display of fixtures are not shown Opposite page top—Holophane floodlight for parking area built into building Opposite page bottom — Fluorescent fixtures light main aisle of basement

Second floor: Holophane Lobay reflectors on 10-ft. centers maintain 20 ft.-candles.

In December, the new building was officially opened with the standard ceremonies. Vice-President D. E. Harris was on hand for the occasion and returned to his San Francisco office with the prediction that, based on the exceptional customer interest, the lighting installation would soon pay off simply on the basis of its demonstration of what good lighting can do.

● Les Klos, president of Electronics Engineering Corp., S 175 Wall St., Spokane, has invented a "germ killer" and has placed it in operation in a local food store. It is a good-sized box with ultraviolet lamps in it. The shopper takes a load of groceries, fruits, vegetables and meat in a market basket or cart and places the basket or rolls the cart into the box. Thirty seconds later, according to Klos, any germs on the food are killed by what Klos said is exposure to "condensed sunshine."

● Purchase of 100 refractor type street lighting units has now been authorized by the electric light committee of the Victoria, B. C., city council. Installation of the units was to start in January in residential areas. Because of the success of five units installed at the Ross Bay seawall, and at the request of residents, eight more similar units will be placed along Dallas Road from Clover Point to St. Charles St.

● Bids were asked for in December, for installation of flood-lighting systems on tennis courts and the athletic field at Orange, Calif., high school grounds. Plans were drawn by Architect Harold Wildman and Walter H. Smith, electrical engineer, and call for 62 floodlights on the athletic field, and a coin meter controlled system on the tennis courts. Contracts specify that work get underway by February.

● Magic of Fluorescence, a colorful 15-minute sound movie, has been announced by General Electric Lamp Department. It was produced by Raphael G. Wolff Studios, Hollywood, in technicolor, and employs extensive use of cartoons.

ELECTRICAL WEST

McGRAW-HILL COMPANY OF CALIFORNIA
68 POST ST. SAN FRANCISCO . 4

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Sedate and Silent Engineers

SEVERAL engineers have expressed bitterness, resentment, perplexity and finally frustration in recent weeks when discussing the national political and economic trend. We cannot give them very much sympathy because the blame for some of the current difficulties rests just as much with them as it does with many other apathetic segments of the American public. For all of the tasks and great responsibilities imposed upon him, the engineer is a reticent, sedate and restrained individual. He is far more concerned with his technical problems than he is with his social obligations.

In this connection we cannot help but agree with what John C. Stevens, president of the ASCE, who in decrying the total lack of engineering representation among the large and varied groups of advisers to the American delegation at the San Francisco UNO conference recently said: "The engineer is not organized into pressure groups. He devotes his time to civic service only on special request. He can solve technical problems but rarely is consulted on human problems. Public relations for him are merely word sounds without an urge to action. Politics is almost anathema in his thinking. He appears to prefer being left alone in his own technological world without fanfare . . . ."

We think that Mr. Stevens was being kind to the members of his own profession. Certainly he could have been much more critical of the circumspection, silence and inhibition of engineers as a class. Until and unless they get over their inherent bashfulness and become as vocal as other pressure groups, they cannot expect to gain recognition either for their position or their point of view. Mr. Stevens says the engineer "can and must broaden his social horizon if he hopes to play effectively his part in getting this turbulent world back on an even keel." We agree heartily.

Tax Equality May Come

FULL IMPLICATION of the Saratoga Water decision of the U. S. Supreme court on the question of tax immunity of governmental agencies engaged in the power business must await either additional judicial opinions or additional federal legislation. In finding that New York State was liable for federal taxes on its state owned and operated mineral water business, the Supreme Court justices were obscure as to the full and final application of the concept of reciprocal tax immunities.

Here in the West tax immunity furnishes most governmentally operated electric utilities their principal advantage over business managed systems. Such rate differences as apply between the two different types of management largely stem from the immunity from federal taxes enjoyed by the public systems. Establish tax equality and the advantages disappear. While the Saratoga Water decision fails to do this, it does indicate a new trend in judicial attitude.

Housing Bottleneck

ONE of the most serious economic and social problems stemming from the war is the acute shortage of residential structures. The situation is particularly bad here in the Far West where population gains have been so large. Unless there is some immediate relief whereby supply and demand are brought somewhere within balance, the entire economic rehabilitation of this area may be affected.

The demand for new housing stems from many sources. And it involves many segments of population of which the demobilized veteran is perhaps the most important. Certainly conditions are building up to a disturbing blowoff unless labor and wage difficulties and building materials and their prices reach some sort of an adjustment which will insure more rapid progress in providing housing.

There are two phases of the situation that involve the electrical industry. One is the frequently mentioned statement that most building codes are not only highly restrictive but are also completely out

of date. It is difficult to interpret the National Electrical Code as being in either category but, in view of the criticisms, it would be well to examine the Code to see if changes are possible which will not only expedite housing but which will reduce the over-all cost.

The other proposal meriting serious attention is that the government enter the housing picture through the encouragement and subsidization of mass-produced prefabricated houses. The electrical standards and electrical adequacy of such structures may not measure up to modern requirements unless some group in the industry assumes responsibility for selling the necessity.

Housing represents one of the great markets for the industry. Every possible measure should be taken to break the present bottleneck.

Where is the Ceiling?

PRESSURE is something that should be better understood by economists. If they had an engineer's realistic appreciation of it they would know that to confine great pressure there must be no leaks anywhere. Poor old bedevilled OPA, like the little Dutch boy and the leak in the dyke, has been trying to hold back an ocean of pressure by itself with two hands. There are far too many holes.

We have come to an impasse in production that is not all the fault of strikes. The ceilings on price have turned out to be ceilings on production. Unable to produce former goods at former prices when there is internal pressure of higher wages and higher operating costs, factories are leaking their energies, their incentives and productivity into making new and strange things for which they can get a new and more realistic ceiling.

On the appliance and electrical equipment front, the standard and needed items, as staple as butter or shirts are in their respective fields, are not available anywhere, but all sorts of unwanted and unneeded things are made instead, because they can be made at a profit.

And wages are still going up to exert still more pressure.

The only cure for it seems to be to let the force of production and competition take all the pressure out of inflation and let it down. At first prices will zoom, but production will zoom and take the pressure all out of it. Price is the incentive to production. At first it will be high, but competition will put the only brakes on price that will work. Competition will be the only spur that will drive to higher efficiency and reduce excessive profits. These are natural forces and work far more drastically than all the presidential or bureau directives in the world. The trouble with human efforts to control things is that no human can visualize all the forces that are upset by control of some single element and which themselves get completely out of hand.

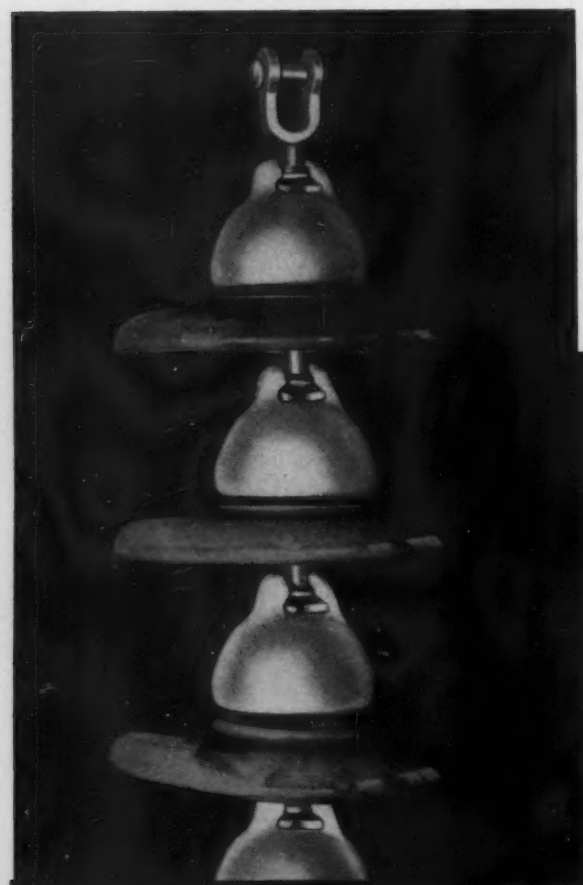
The sooner nature can take its course, the quicker every natural balance will be effective. Surely this entire era has proved that it is shear egotism to imagine that the laws of supply and demand can be pushed aside, no matter how noble the reason.

STRIKING workmen in crowds exercise rights which no individual has. In other words, 10 or 10,000 may do something as their right which one man could not do without committing a crime. This is now accepted in all society, and we commonly use the phrase, "the right to strike." Obviously it is a vague term and needs definition. For instance, may the milkman who delivers milk to my door, which my granddaughter needs to sustain life, strike and prevent anyone from delivering milk, thereby causing the death of the child? Could the milk company refuse to deliver it? Society cannot safely be at the mercy of men or organizations. Freedom has taken on a new definition . . . How could we live in a city if the employees of the Electric Power Company, or the Company, refused to furnish electric power, which is absolutely necessary if the life of a city is to continue for twenty-four hours? As a people we seem to shrink from facing issues of this kind. Perhaps we don't want to admit how utterly helpless we have become. As far as I am concerned, the man who takes from me by force what is not rightly his is a robber, even if a vote is taken on it or his number is legion. Tyranny may be exercised by the many as well as by the few. . . . We need to awaken to the fact that there is no end to the business organizations or groups of people who can, by the simple act of stopping work and preventing others from doing their jobs, hold up the rest of society and extract any penalty they wish. We need to acknowledge duties as well as rights. The company which delivers milk to my home has a grave responsibility which it cannot escape. Society at large should know and evaluate this fact, and employment and remuneration should reflect it. Unless there is public acceptance of duties as well as of rights, our economy will slow down by right checking right, until we are literally doing more and more and producing less and less, and the unbalance may become so chronic that we may literally run down entirely.—A. W. Robertson, chairman of the board, Westinghouse Electric Corporation.

FOR TRANSMISSION LINE DESIGN USE

For Top of Single Suspension

BALL SOCKET TYPE



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Sold only through your insulator manufacturer

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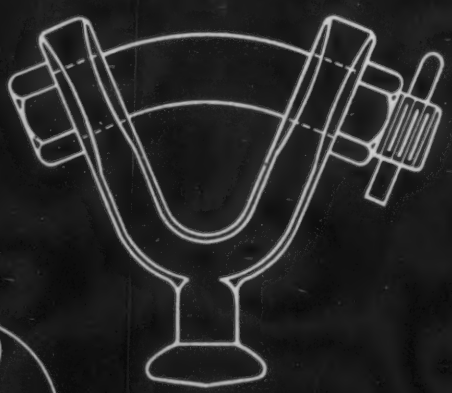

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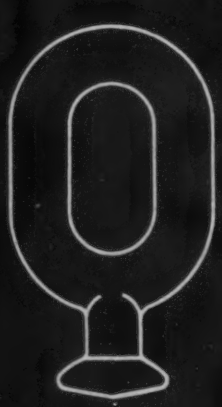

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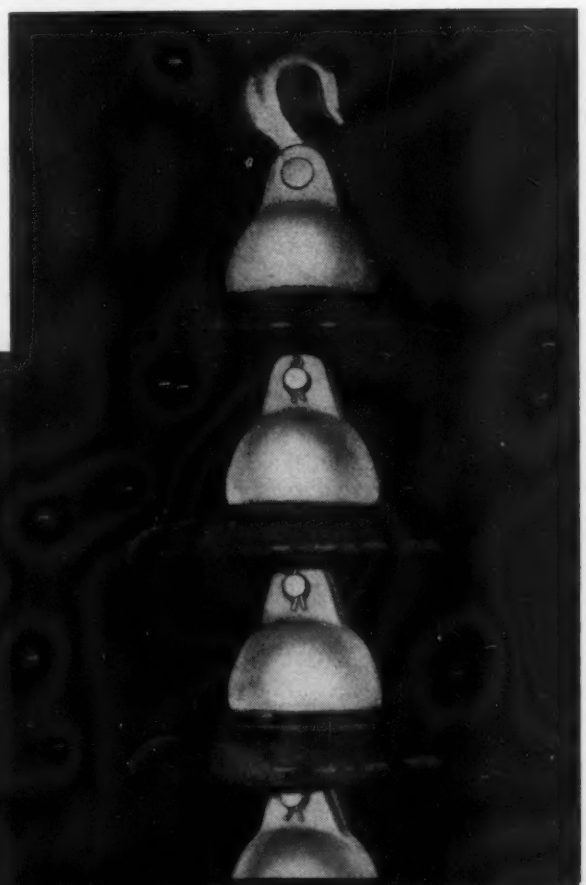

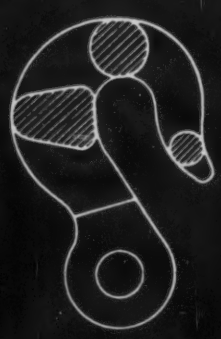

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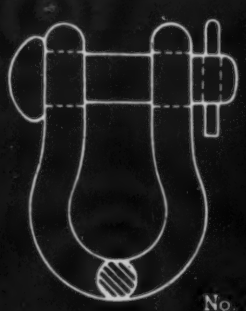

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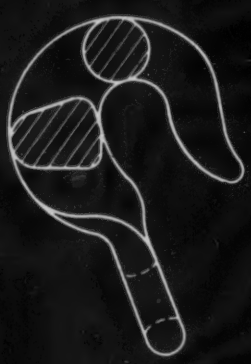

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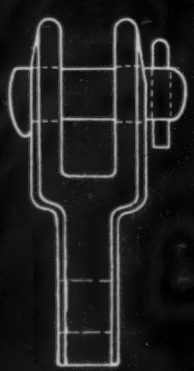

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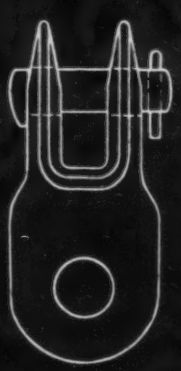

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NEWS of the industry

PUGET POWER PURCHASE STILL BEING DEBATED

Acceptance of the proposal by Snohomish PUD and continued refusal of Whatcom to sign were developments last month in the $135 million Puget Power purchase plan. Whatcom is holding out on the ground that the operation under PUD control is not soundly set up, and has indicated willingness to join, provided it can make its own arrangements for an independent power hookup.

Report of J. Samuel Hartt, Chicago consulting engineer, hired by Snohomish PUD to examine the proposal, expressed belief that the operation ultimately could be successful but pointed to several weaknesses.

According to Hartt, the districts have been highly favored by valuations placed on the distribution systems in their respective districts, while the price assigned to the Seattle properties is above real value.

Hartt's calculations would place the PUD plan valuation of the Seattle system in the integrated set-up at $32,900,000, some $12,000,000 more than the highest figure any Seattle public official or agency has placed on the properties. The $60,897,000 placed on the Puget Power system by Myers and his associates is described by Hartt as "definitely inflated."

Other weaknesses pointed out by Hartt are lack of allowance, in commuting operating revenues, for rate reductions increased labor and material costs, and increased taxes.

Meanwhile city officials were quoted as stating that both the PUD proposal and the Hartt report omit mention of future City Light rate reductions, which PUDs, if they acquired the Seattle distribution system, would have to meet for the 50-year life of the contract.

Competitive Bidding Ordered by Commission

California Utilities must submit security issues in excess of $1,000,000 to competitive bidding, according to a recent ruling of the California Railroad Commission.

The commission's order requires that all public utility corporations under its jurisdiction hereafter accept written sealed bids in cases of financing both new and refunding issues over the million figure.

In rendering its decision the commission said it believed competitive bidding is to the public's interest because it results in a lower money cost, and that in a declining market a utility has a better chance to sell its bonds.

Exceptions to the ruling include issues that the commission may find best handled by direct sale, issues designed for exchanges where no commission is involved, securities to be issued prorata for existing issues, securities offered in reorganization and adjustment proceedings under court order and notes on conditional sales contracts payable within five years.

Eastern Oregon Company Approves Purchase Offer

Offer of California Pacific Utilities Co. to purchase Eastern Oregon Light & Power Co. properties for a reported $2,300,000 was approved last month by the latter's board of directors.

To close the sale, approval must be secured from the stockholders of Eastern Oregon, and from the public utilities commission of Oregon and the California Railroad Commission. The matter was to be voted on by the stockholders on Jan. 31.

Both companies are at present operating electrical facilities in La Grande, Ore. California-Pacific will add the towns of Baker, Elgin, Cove, Haines, and Union to their distribution system as a result of the transaction. It is already serving in Burns and John Day, as well as having other utility properties in Idaho, Wyoming, Nevada and California.

At the directors' meeting, J. A. Ward, president of California-Pacific, assured LeRoy A. Grettum, retiring president of the Oregon firm, that all employees, including those still in the armed services, would be invited to join the California-Pacific organization at present wages and salaries, with seniority retained, and expressed the hope that all Eastern Oregon Light & Power personnel would remain with the new management if the sale is approved.

Ward also said his company intends to extend electric service to more farms as soon as conditions permit, and rates would be reduced whenever earnings warrant such action.

When the sale is effective, Elmer E. Kime, now manager of California-Pacific properties in southern Nevada and California, will head the Eastern Oregon property. Grettum has accepted a position in the East.

PUD GIVEN TITLE TO PGE CLARK COUNTY SYSTEM

Clark County PUD on Jan. 10 secured title to Portland General Electric Co. properties in Vancouver, Wash., and vicinity, after Judge Charles H. Leavy had signed a decree of appropriation in federal court at Tacoma. The transfer took place despite a notice of appeal filed by the company, which plans to take the case to the U. S. Circuit Court.

A warrant for $801,000, the valuation fixed by a federal court jury on the properties in condemnation proceedings, plus $230 costs, was deposited in the United States clerk's office at Tacoma and may be taken up at any time by PGE.

The company lost its legal battle in connection with the transfer when a Clark County superior court ruled that PUD directors had the power under state laws to sell revenue bonds under par. A taxpayers suit had been brought to prevent sales of bonds to a Des Moines, Iowa, bonding house on the ground that the deal was made without competitive bidding. The PUD had announced sale of a $1.000,000 par value bond issue for $972,500. Spokesmen said the difference between the sales price of the bonds and the condemnation price would be used to set up an operating fund.

When transfer of title was postponed from Jan. 1 to Jan. 10, an agreement was made by which PGE received the gross revenue for the first six days of the extended period and the PUD the following four. PGE will continue billing for two months, or until the PUD can secure required billing machines. The company will pay all 1945 taxes.

PUD manager George Hibbert said rates now in effect will remain until an analysis is conducted at a future date. Bonneville power has been offered to the public utility on the E-2 rate at a maximum of 3.5 mills during a four-year development period.

A new substation will be constructed to connect PUD lines with the Bonneville substation at the Vancouver shipyards.

● Southwestern Public Service Co., Roswell, N. M., was authorized by FPC to buy $115,000 worth of electric facilities at Santa Rosa, N. M. and vicinity. The generating plant and distribution facilities serve approximately 433 customers.

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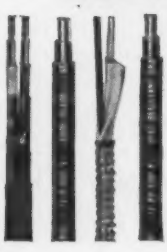
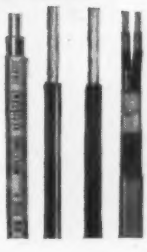
9. Free stripping—Braid, paper armor and insulation all free stripping
10. High rating—Approved for 60 degree C operation

You'll like high quality PVX cable. Its small diameter and light weight make it easy to install. Its Type T conductors are insulated with thermo-plastic compound which is resistant to oils, acids, and alkalies. These conductors are protected with an improved crushed paper armor and covered with a tough moisture-resistant overall braid. The whole assembly can be freely stripped. PVX is recommended for open and concealed work in homes, farm buildings, etc., where permitted by local codes and the National Electrical Code.

OTHER G-E BUILDING WIRES AND CABLES



In addition to PVX there are many other wires and cables in the G-E line—wires and cables for every purpose. G-E building wires include Types T, TW, R, RH and RW in sizes No. 14 to 2,000,000 CM. G-E cables include BX armored cable, BraidX non-metallic sheathed cable and service entrance cable Type SE in all wanted sizes. These wires and cables are carefully made, uniform and have high quality.



For further information on the new PVX cable or on other G-E wires and cables see the nearest G-E Merchandise Distributor or write to Section W261-18, Appliance and Merchandise Department, General Electric Co., Bridgeport, Conn.

GENERAL ELECTRIC

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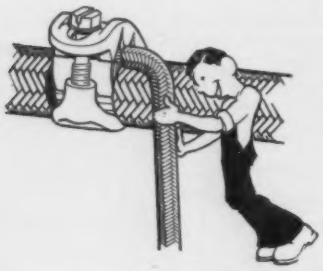

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AGREEMENT PROVIDES FOR BOULDER TRANSMISSION

California Electric Power Co. will be permitted to transmit excess Boulder Dam power over Southern California Edison Co. lines under a 42-year contract approved by the California Railroad Commission. A departure from usual policy, the agreement is related to basic Boulder contracts of similar length, the commission said.

The power, assigned to Metropolitan Water District in southern California, had been intended for use by the RFC and suspended operations at the Basic Magnesium plant at Las Vegas, Nev.

Surplus energy now has been divided, with 55% going to the city of Los Angeles, 40% to Southern California Edison, and 5% to California Electric Power. In the Edison-California Electric contract, provision regarding the latter's share of power stipulates delivery on demand charge of $1 a kilowatt of monthly maximum demand for the first five years, with rates after that to be calculated on a cost formula contained in the contract. California Electric Power pays not less than 90% of its allotted energy at a 70% load factor, and pays Edison for generating charges at Boulder. In addition, it handles energy charges direct with the government.

The California Railroad Commission, commending the new contract as a trend toward cooperative use by utilities of "inescapable investment capital utilities," promised to conduct periodic investigations of the agreement.

Washington CREA Announces Projects at Spokane Meet

Continued studies in electric house heating and hay drying will play a major part in the 1946 program of the Washington State Committee on the Relation of Electricity to Agriculture, it was voted at the committee's recent all-day conference in Spokane. A research budget of $6,250 was approved.

Economic studies on the use of electricity in different agricultural areas of the state and uses of electricity in poultry farming were adopted as new projects for the year.

The house heating project will be conducted in cooperation with the Washington State College engineering experiment station.

Dean E. C. Johnson of the WSC college of agriculture resigned as chairman of the group, following 21 years in that post and was succeeded by Dr. Mark Buchanan, new director of the agricultural experiment stations of the college.

Announcing

the entry of Resin Industries, with its tested thermoplastic resin compound, RESINITE, into the field of custom wire insulating and jacketing.

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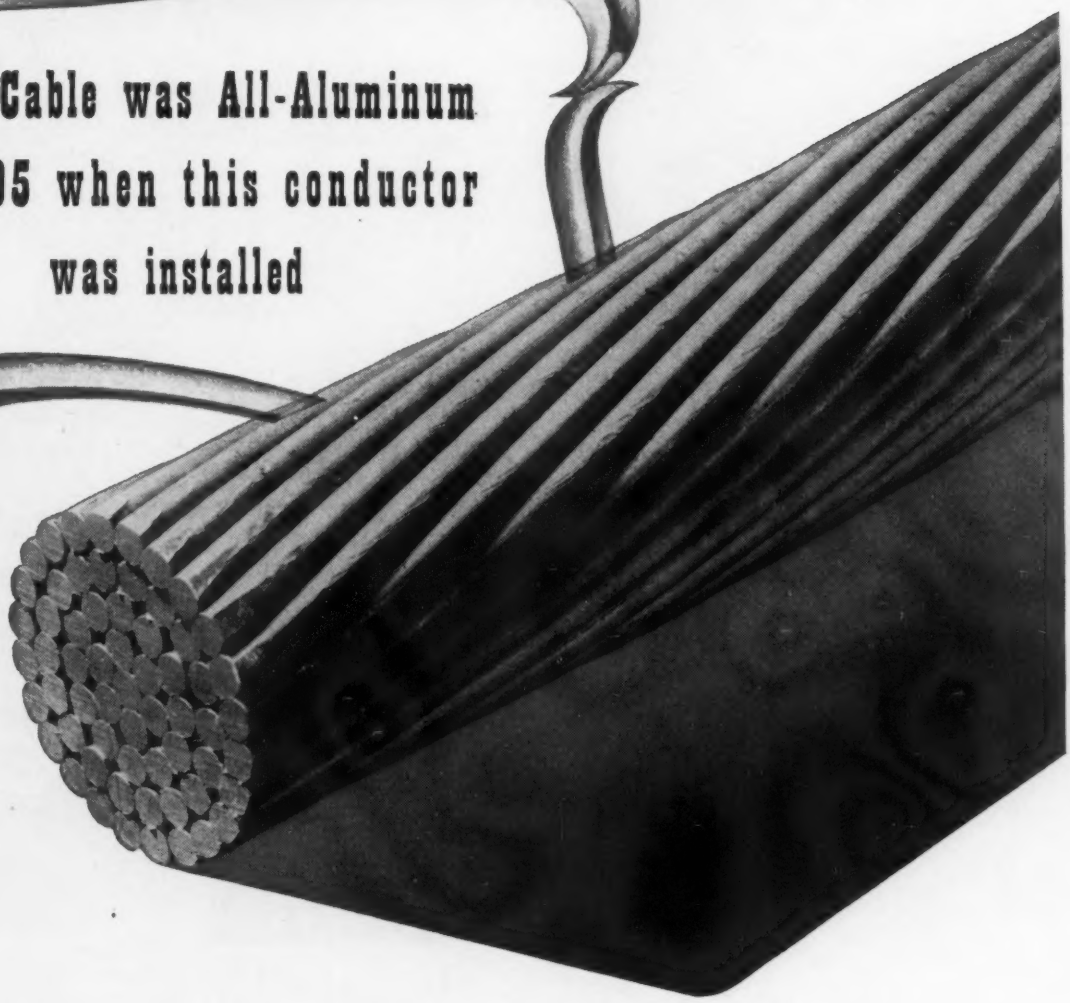
of especial interest to the appliance manufacturer. RESINITE can be produced in any color as well as transparent, thus affording smart, attractive cords that can match or contrast with appliance colors.

RESINITE insulating tape and tubing in stock sizes.

Send for booklet showing complete listings.

RESIN INDUSTRIES
SANTA BARBARA · CALIF

Alcoa Cable was All-Aluminum in 1905 when this conductor was installed



Alcoa introduced **A-C-S-R** *in 1909*

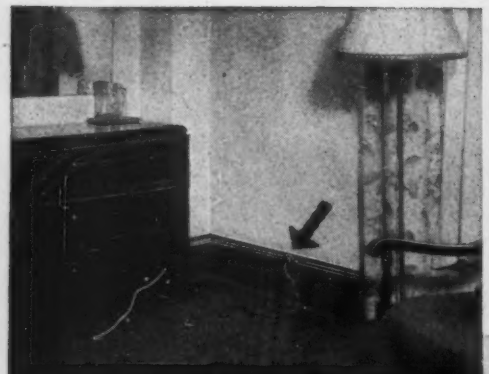
Still in service after forty years, this Alcoa Aluminum cable had its picture taken to illustrate this fact: Alcoa's recommendations on line construction and Alcoa A.C.S.R. are backed by many years' experience.

That's why it pays to come to Alcoa when you are planning a line. That's why you profit when you build with Alcoa A.C.S.R. Hi-line or rural line, your construction is more economical, most dependable, when you employ these conductors according to standards recommended by Alcoa engineers.

For help in designing or erecting a power line, get in touch with the nearby Alcoa district office. Or write ALUMINUM COMPANY OF AMERICA, 2132 Gulf Bldg., Pittsburgh 19, Pa.

ALCOA A-C-S-R

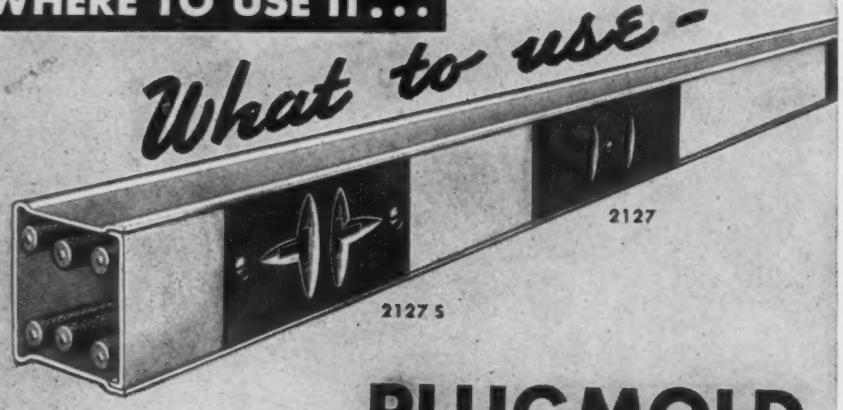
ALUMINUM CABLE STEEL REINFORCED



WHERE TO USE IT...

Wiring for convenience and economy of maintenance in hotel rooms requires ample outlets, properly placed, for floor, desk and bed lamps . . . fans and appliances . . . located with special regard to the comfort and safety of guests. This photograph shows how Plugmold, installed above the baseboard, is being specified for this purpose by an increasing number of hotel operators.

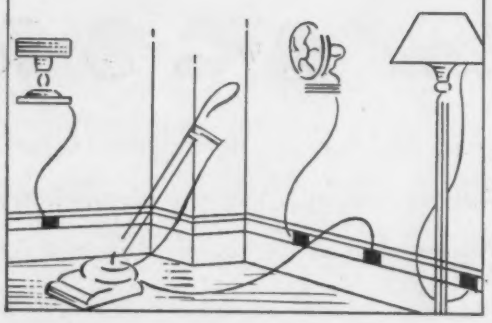
What to use -



PLUGMOLD

No. 2100 Plugmold—Capacity: 6 No. 12 R.C. Conductors with receptacles installed; 10 No. 12 R.C. Conductors without receptacles.

HOW TO USE IT . . .



Diagrammatic drawing shows typical installation of Plugmold No. 2100 in hotel rooms. Outlets may be located exactly where required and in the number required for adequate service. When redecorating or re-arranging rooms the location of outlets or the number of outlets may be changed without disturbing the basic installation . . . making Plugmold an extremely economical long range investment from the maintenance point of view, eliminating hazardous long extension cords and the pilferage of plugs and accessories that has in the past proved a costly item.

ELECTRICAL CONTRACTORS

Business publications like these, with aggregate circulation of over 240,000 monthly among your prospects and customers, carry Wiremold advertising messages designed to HELP YOU BUILD BUSINESS. Tie in with this aggressive promotion program.

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Hartford 10, Connecticut

NEMA KNOW YOUR WIREMOLD

BUSINESS BUILDER IN TOMORROW'S MARKET FOR ADEQUATE WIRING

ARMY E NAVY

SOLD THROUGH ELECTRICAL WHOLESALERS . . .
INSTALLED BY ELECTRICAL CONTRACTORS . . . EVERYWHERE!

SNAKE RIVER POWER MARKET, SUPPLY WILL BE STUDIED

Power market and supply of the basins of the Snake River and tributaries down to and including the Salmon River will be studied jointly by the Bureau of Reclamation and Bonneville Power Administration, it was announced last month by the Department of the Interior.

The agencies will submit recommendations for a power construction program for the basin consistent with the full development of the area, including dams, generating and transmission facilities, and proper wholesale power rates, the announcement stated.

Following the announcement of the survey, C. J. Strike, president of Idaho Power Co., pointed out that for more than a quarter of a century, reclamation and power requirements in Idaho have been met by existing agencies with a steady and economical development of both land and water resources and without the subsidy of taxpayers' money.

Strike added that he presumed the survey would be paid for from the $1,000,000 asked of Congress in the 1946 deficiency apropriations bill for "general investigations" pertaining to Columbia River and Bonneville.

Pointing out that the private companies and municipal agencies serving southern Idaho stand by commitments made as early as 1939 to the bureau to provide an immediate market outlet for reclamation power at a competitive price, Strike warned "if reclamation power developments are not completed in time to meet demands for electric service, the present agencies will proceed with the development of their own power resources to meet such demands."

Montana Group to Push Rural Electrification

In a move toward reorganization of its rural electrification program, the Montana Water Conservation Board has tentatively decided to establish offices in Billings and Glasgow, supplementing the central office at Helena. Fred Buck, chairman of the board, reports that the rural electrification program has extended to all parts of the state, and no longer can be administered efficiently from one central office.

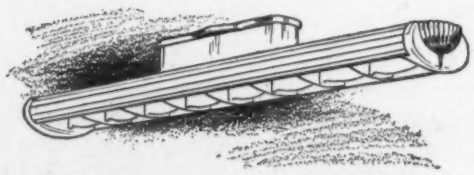
The board deferred action on a petition that it operate two Helena Valley pumping projects which for over 30 years had been operated by Montana Power Co. Farmers served by the plant requested the board to take over after the company abandons the operation.

Virden Opens the Residential Fluorescent Market

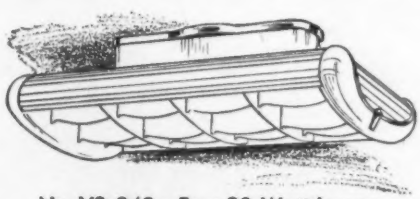
Virden's VS-224 featured above is smart—in a true sense.

It utilizes modern plastics and metals to achieve lightness, grace and beauty. That's smart—but while its designer had in mind a modestly deluxe kitchen unit, the public grasps a wider range of usefulness—that's smarter.

The public sees in these fixtures fluorescent lighting for dining room, bathroom or bedroom. They want fluorescent now. This fixture and its companion No. VS-242 make fluorescent pleasantly available at reasonable cost.



No. VS-224—Two 40-Watt Lamps



No. VS-242—Four 20-Watt Lamps

JOHN C. VIRDEN CO. • Cleveland, Ohio

EVEN A PLAY HOUSE NEEDS HEAT

ELECTROMODES FILL THE BILL

Wherever there are children you will also find a "play house." Whether it is in the bedroom, living room, or nursery, proper heating is necessary. Electromode Portable Heaters eliminate drafty, cold floor areas and keep the warmed air circulated where it can produce the most comfort—in the living zone for adults, in the "play house" zone for children.

Model PJ-13: Only Electromode has all these vital features: cast aluminum element, controlled air flow, air cooled cabinet and safety switch.

Model WJ-13: For those who prefer a Bilt-In-Wall Heater for bathroom, nursery, den or playroom, this Electromode requires no floor space and furnishes quick, clean, safe, odorless heat in-an-instant any time.

Safety is also essentially important and Electromodes, with their exclusive cast aluminum heating element, are safe. There is no fire hazard: Heating element radiates heat so rapidly as to remain relatively cool and is completely enclosed in cabinet. A Safety Switch automatically shuts off heater in case of air flow stoppage from any cause.

Electromodes are quiet, clean, and efficient. The streamlined cabinets harmonize attractively with other modern home furnishings. Ask your wholesaler to allot you a reasonable stock. ELECTROMODE CORPORATION, Div. of American Foundry Equipment Co., 436 So. Byrkit Street, Mishawaka, Ind.

ELECTROMODE
Room Heaters

Illustrated Brochure 46-D sent promptly on request.

West Coast Representatives
Seattle, Wash.—Fred W. Carlson, 307 Wall St.

UTILITIES TO REPORT ON EXCESS PROFITS TAXES

New Mexico utilities are being asked by the state public service commission to report on excess profits taxes paid the government since 1941, as the first step in a projected survey of possible rate reductions in a number of urban areas.

Plans for the survey were announced shortly after the Federal Power Commission ordered the gas company serving Clayton, N. M., to cut its rates by about one-third, and after the New Mexico commission had approved a reduction in electric rates for New Mexico communities served by El Paso Electric. The survey was requested by Governor John J. Dempsey.

New Mexico utilities which have reported their excess profits taxes for 1944 to the commission, with the amount of taxes for that year, are: Albuquerque Gas & Electric Co., $340,986.11; Community Public Service Co., $137,795.01; Deming Ice & Electric Co., $57,439.14; El Paso Electric Co. (New Mexico portion), $67,220.18; Las Vegas Light & Power Co., $19,777.00; New Mexico Power Co., $120,515.00; Southern Union Gas Co. (total, including Texas), $129,000.00.

The rate reduction of the El Paso Electric Co. affects Las Cruces and small communities between Las Cruces and El Paso, Texas, with reductions expected to total $17,222 annually in electric bills of 30,000 New Mexico customers. The new rates, which are like those put into effect last month in El Paso, are 4.5c per kilowatt-hour for the first 50 kwh. 3c per kilowatt-hour for the next 50 kwh. and 2c for all over 100 kwh. They are said to be the lowest electric rates in New Mexico.

BPA Action Against Puget Power Settled Out of Court

Bonneville Power Administration action against Puget Sound Power & Light Co. to collect $272,739 on power deliveries was settled last month by out of court payment of $185,000.

According to the original complaint, Bonneville authorities had asked for $1,296,925, covering power deliveries beginning with the expiration of their contract with Puget Power between Oct. 31, 1944, and July 1945, and based on applicable rate schedules. Puget Power, in paying a portion of that amount, had objected to additional payment, terming "unfair" the action of the Power Administration in raising the rates.

The Way They're Built is another advantage of L-M Round-Wound Transformers

ROUND WOUND COILS CORE REG. U.S. PAT. OFF.

● L-M Round-Wound distribution transformers offer many design and construction features that make them a sound investment. In addition, the L-M Round-Wound design results in many desirable electrical characteristics, such as improved regulation at all power factors; better ratio of losses; lower exciting current; higher short-time overload capacity; and higher impulse strength.

Here are some construction features that make L-M Round-Wound Transformers worth investigating:

❶ Cover—strong, rigid, will not distort.

❷ Tank edge rolled, will not cut gasket.

❸ Four cover clamps; assure tight seating of the gasket; easy removal if needed.

❹ Pocket mounted high voltage bushings protected against damage by deep drawn seam-welded bushing hood.

❺ Low voltage bushings are double gasket sealed to prevent oil siphoning; externally clamped, easily removed.

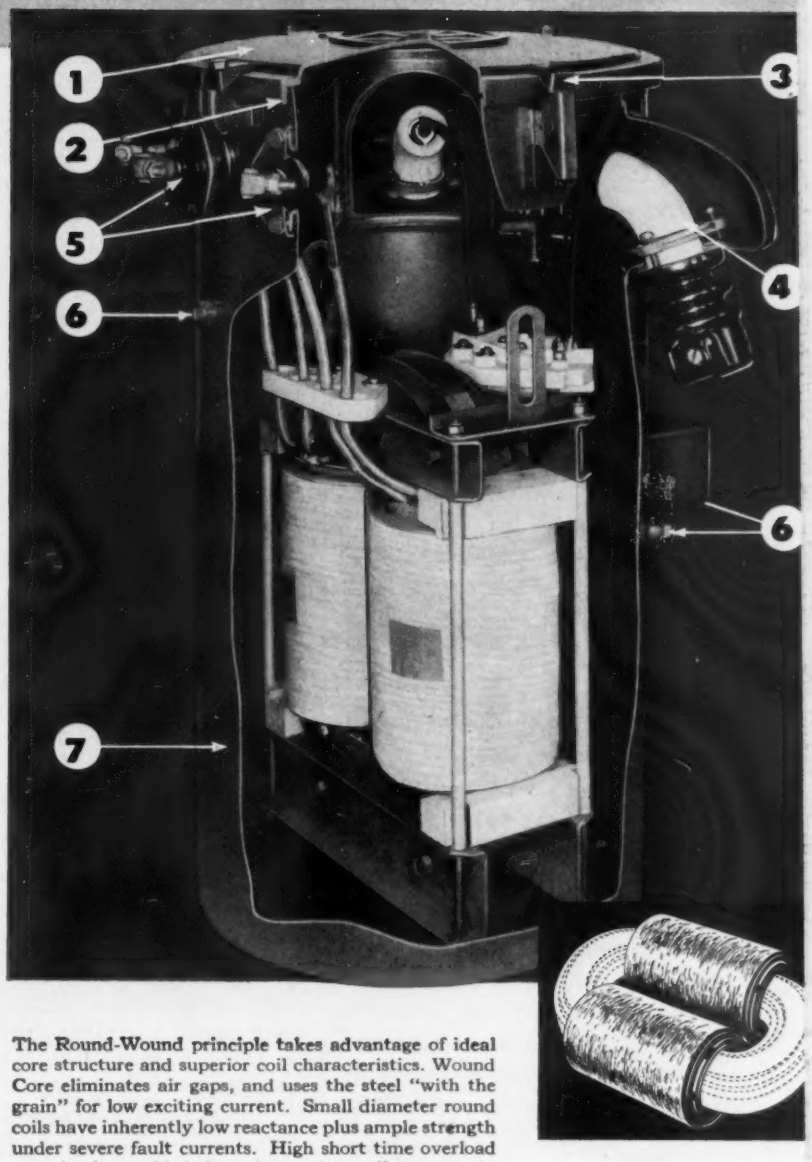
❻ EEI-NEMA standard pole mounting brackets and ground pads.

❼ Copper-bearing rust-resisting steel tank. Upside-down test of transformer assures tight gasket seals.

Also available with simple, rugged tap changer; handle and indicator above oil level.

Sizes and Ratings

Available in ratings from 1½ to 25 Kva, 2400 to 7620 volts. Built under EEI and NEMA Standards.



The Round-Wound principle takes advantage of ideal core structure and superior coil characteristics. Wound Core eliminates air gaps, and uses the steel "with the grain" for low exciting current. Small diameter round coils have inherently low reactance plus ample strength under severe fault currents. High short time overload capacity is provided through complete coil exposure to cooling oil and ample coil ducts.

Write for bulletin RW-421

Ask the L-M Field Engineer for a copy of this informative bulletin. Or write Line Material Co., Transformer Division, Zanesville, Ohio.

Other L-M Transformers

Line Material manufacturers distribution transformers up to 500 Kva.; 15,000 volts and below; Type 3-I (Completely self protected) Dry Type; Subway, three phase, and others. Bulletins are available on request.

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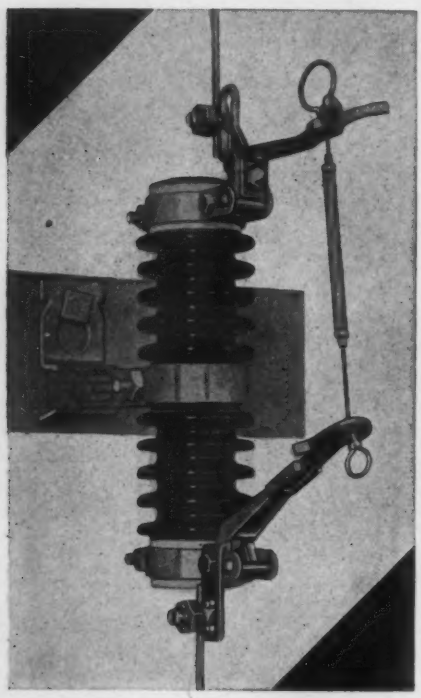
LINE MATERIAL TRANSFORMERS

L-M DISTRIBUTION EQUIPMENT INCLUDES: Distribution Transformers • Fuse Cutouts and Fuse Links • Lightning Arresters • Oil Switches • Pole Line Hardware • Line Construction Specialties • Underground Equipment • Fibre Conduit • Street and Airport Lighting

MATTHEWS
PROTECTOLINK
CUTOUTS



Efficient protection at low cost is provided in these ruggedly constructed open link type cutouts. Protectolink fuse links are designed so they cannot be installed upside down and design of contact arms permits ease of fuse link installation. The spring tensioned lower arm automatically seats fuse link contacts into contact recesses in the arms, thereby assuring positive and radio noiseproof contacts. Matthews Protectolink Cutouts and Fuse Links are interchangeably adaptable with all other makes. Rated 50 amperes current carrying capacity and 5 Kv., 7.5/12.5 KV. Grd. Y and 15 KV. voltage ratings.

Write for Bulletin 101-A

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3722 FOREST PARK BLVD.
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UTAH REORGANIZATION GIVEN COURT APPROVAL

Following a hearing in Salt Lake City, U. S. District Judge Tillman D. Johnson signed an order allowing Utah Power & Light Co. to proceed with reorganization plans already approved by the Securities and Exchange Commission.

The hearing had been postponed previously by the court from Dec. 19, because an objector, Lazarus S. Heyman, New York City, was unable to be present at the earlier date. Heyman failed to appear at the hearing, although he sent the court a written objection.

Under the reorganization plan, the Utah company will sever financial connections with Electric Power & Light Corp., which previously held all of the company's common stock, and from Electric Bond & Share. A new common stock of $20 stated value will be exchanged for all outstanding preferred stock at a ratio of 4⅞ shares for each 7% preferred share and 4⅜ shares for each 6% preferred. A cash payment of $650,000 will be made to Electric Power & Light for Utah Power & Light's old common stock of which the holding company has 3,000,000 shares.

The new simplified capital structure will consist only of debts and common stock, of which there will be 1,185,241 shares outstanding.

New Safety Specifications For Linemen's Equipment

American Standards Assn. has established five new safety specifications for linemen's protective equipment, covering line hose, insulator hoods, leather protector gloves, rubber blankets and sleeves. The project was undertaken at the request of WPB but resulting specifications are suitable for general use.

The committee developing the standards was drawn from power users, employers of linemen, manufacturers of protective equipment, insurance companies, government and private testing agencies, Department of Labor, and the Union of Electrical Workers. Copies may be secured for 30c each from the American Standards Assn., 70 E. 45th St., New York 17.

● Cowlitz County PUD, which supplies electricity to Longview, Wash., and surounding rural areas, will go into the water business as well. A system will be constructed to serve water to three rural communities north of Longview.

Electrical
INSULATING
Material

THE SPAULDING FIBRE COMPANY, INC.
Spauldite (Laminated bakelite) Sheet, Rod & Tube.
Spauldite Washers and fabricated parts.
Spauldite Gear Blanks.
Spauldo Slot Insulation.
Vulcanized Fibre Sheet, Rod & Tube.
Formed Fibre Slot Wedges.
Fibre Washers & Fabricated Parts.
Fibre Receptacles.
Armite (Fishpaper) Plain or Gummed.
Friction and SoftBoard.

THE MACALLEN CO.
Compressed Mica Sheet, Tube, Washers & Specialties.
Raw Mica.

THE HOPE WEBBING COMPANY, INC.
Cotton & Linen Finish Electric Tapes, Webbings & Sleevings.

IRVINGTON VARNISH & INSULATOR CO.
Harvel Insulating Varnishes.
Varnished Cambric, Canvas and Silk, Varnished Fibreglas Cloth.
Varnished Paper.
Varnished Tapes.
Varnished Sleevings (Spaghetti).
Transflex and Hyflex Tubings.
Harvel OIL STOP.

JOHN A. MANNING COMPANY, INC.
Pressboards, Insulating Papers.

DUREZ PLASTICS & CHEMICALS, INC.
Phenol Formaldehyde Molding Powder.

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DISTRICT COURT RULES FOR SACRAMENTO MUNICIPAL

The third district court of appeals at Sacramento, Calif., last month ruled that the Sacramento Municipal District is entitled to possession of electrical distribution facilities of Pacific Gas and Electric Co. It was expected that the suit would go to the state supreme court after 30 days.

Contending that the California Railroad Commission valuation of $11,632,000 on the property was too low, PG and E further stated that inclusion of side properties in the issue had no bearing on the case. The district has sought to acquire the property since 1934.

Company Asks Court to Set Aside Co-op's Franchise

Petition for a writ of mandamus setting aside a franchise granted to the Walla Walla Electric Cooperative Inc. was filed in superior court at Walla Walla last month by Pacific Power & Light Co. and 70 taxpayers. The petition charges that the franchise application was not made for the purpose of serving the public interest but "as a part of a plan and conspiracy to attempt to dismember and disorganize existing means of providing electric service . . . and unlawfully to attempt to coerce the sale . . . of the properties of Pacific Power & Light Co."

B. C. Electric Lowers Domestic Power Rates

A 25% reduction in the third step of its domestic power rate schedule was put into effect Jan. 1 by B. C. Electric Railway Co. at Vancouver. Annual saving for the 11,000 lower mainland customers affected will be approximately $50,000.

The new rate applies between 230 and 1,230 kwh. and cuts range from one cent to three-quarters of a cent. Users of electric water heaters are expected to benefit particularly.

● FRANCHISE request of the Wasco County PUD will be voted upon at a special election in The Dalles on May 17. The Dalles city council has several times denied the PUD a franchise on grounds that its line would duplicate existing facilities of Pacific Power & Light Co. PUD and city officials are reported studying methods by which the district, if it receives a franchise, might acquire the PP and L system in The Dalles.

● Back in 1913, Buckingham of Binghamton took over the famous Stephens Climber business—a business that had made Safety its watchword since 1901. Buckingham expanded the Climber line to include Linemen's Belts, Safety Straps, Climber Straps, Pads, Tool Pouches, Knives and other equipment. Every piece carefully designed for comfort . . . rigorously inspected for quality . . . and rigorously tested for safety.

The United States Army Signal Corps, twenty-eight great utility companies, and prominent telephone companies, railroads and fire departments all over America are using Buckingham equipment—finding that it meets the most exacting requirements for safety, for practicality, for comfort and economy.

Write today for Catalogue 24 showing the complete Buckingham line.
Buckingham distributors in many principal cities.

Buckingham Climbers, Series 26—Medium Weights. Shanks shaped to fit the leg. Gaff set close to foot piece—less strain on Climber, more comfort for lineman.

Buckingham Climbers, Series 27—Light Weight offset shank brings spur in alignment with the wearer's center of gravity, prevents Climber from twisting and slipping back on leg.

Buckingham Easy Belt, No. 56R

Made of best harness and chrome tan lace leather. Light in weight, yet so constructed that it has ample strength for severest service. Rolled edges. Floating feature in four-loop tool strap for efficient work. Forged Dee-Rings, buckles, individually tested.

Buckingham Featherweight Climber—Average weight 2 lbs. 10 oz. per pair. Rights and Lefts. Ring loops for foot straps.

Buckingham MANUFACTURING CO., INC.
Walter E. Craw, President 5-7 Travis Street, Binghamton, N. Y.

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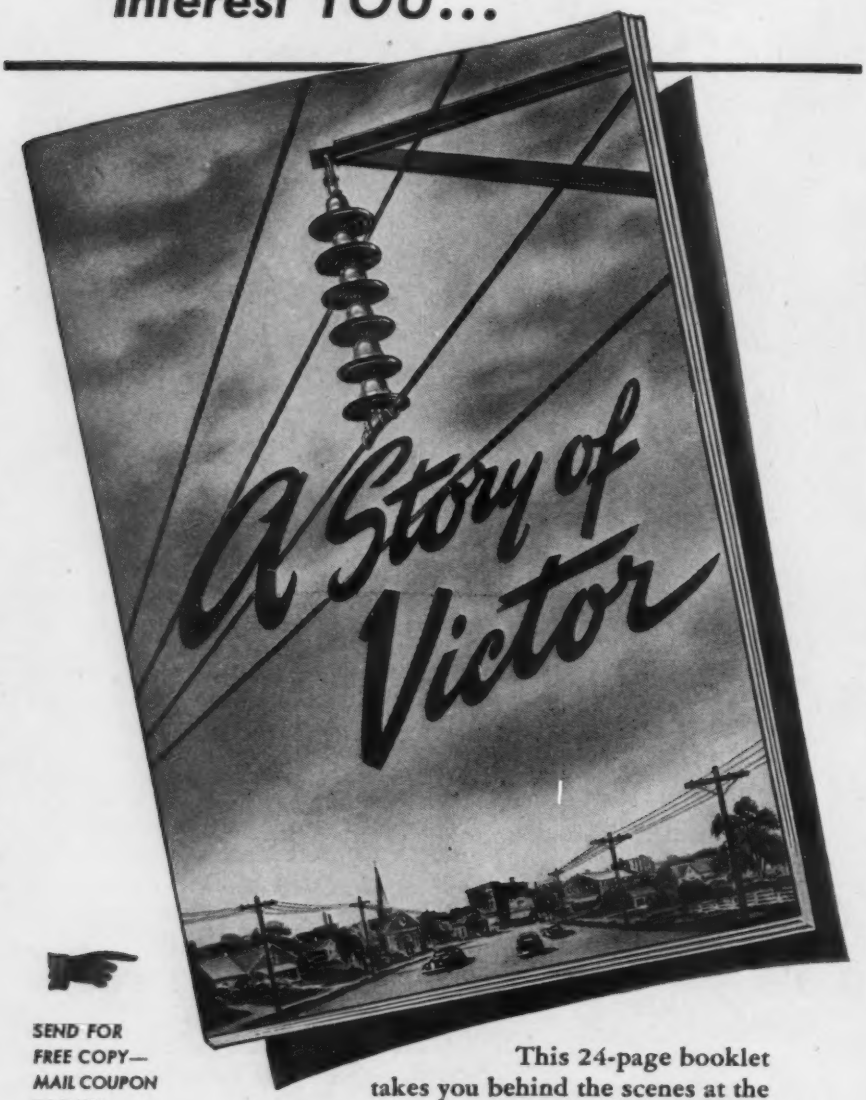

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PG AND E GRANTS WAGE INCREASE TO EMPLOYEES

A five per cent wage increase for all employees who receive under $1,000 a month was announced by Pacific Gas and Electric Co., effective Jan. 1.

The increase, which is subject to union acceptance, will add about $1,500,000 to the company's annual payroll, representing a 32% cumulative increase in basic wages granted to a majority of employees since 1941.

Estimated average monthly earnings of employees in January 1946 were 43.4% higher than in December 1941, the company pointed out, while average employee earnings in 1944 were up 41.6% from 1940. Gross operating revenues increased 38% during the same period, and net income to stockholders was less by $2,642,000 in 1944 than in 1940.

The wage increase was offered to the two unions representing a part of the PG and E employees with the proviso that acceptance would not be considered a waiver of current demands.

City Light Employees Renew Wage Demands

Renewed demand for a blanket 15% wage increase for City Light employees has been made to the Seattle City Council by Earl Wyatt, business agent for Local B-77, and a committee of 2 members representing the IBEW. A blanket $15 cash monthly increase provided for all city employees is not satisfactory to the union, it was stated.

The union has no contract with the city, but acts as spokesman for its more than 400 members employed by City Light. It first presented its wage demand last year, and at that time the council stated that it would meet any wage levels set by Puget Sound Power & Light in its contract with the union.

● NORTHWESTERN fir, larch, Western hemlock and Western tamarack poles may be used in transmission line building and other construction where poles are used, according to an approval order by the American Standards Assn. Tests have proved that Western tamarack shows fiber stress of 7,400 lb. per sq. in., equaling Pacific Coast fir and other pole woods, and surpassing several kinds tested.

● DISCUSSIONS are in progress between the B. C. Power Commission and the Department of Veterans' Affairs in connection with the establishment of a joint training program for veterans.

THE FAILURE OF "FACT-FINDING"

THE PRESIDENT has asked Congress to grant him authority to appoint fact-finding boards to deal with nationally important labor disputes. Most citizens would like to see some reasonable and objective solution of the industrial strife that now is disrupting reconversion. Unfortunately, the record of the "fact-finding" procedure indicates that any claim of impartiality for this process is a gross misrepresentation.

The Administration bill would authorize the President to appoint such boards in cases certified to him by the Secretary of Labor. Each board would report to the President "its findings of fact and such recommendations concerning the dispute as the board deems appropriate." Its facilities and staff would be provided by the Secretary of Labor. The bill provides for an interval of not more than 30 days known as a waiting or "cooling off" period during which it would be "unlawful" (though no penalties are specified) for anyone to promote or encourage work stoppages.

Because the Administration did not wait for Congressional action upon its proposal, but appointed a number of fact-finding bodies to deal with current emergency cases, we have been afforded at least a partial preview of how the procedure may be expected to work out if laws establishing it are passed.

If the reports handed down by the fact-finding panels in the General Motors and oil disputes may be regarded as representative, it can be stated conclusively that Government-appointed "fact-finding" boards will concern themselves to only a minor degree with the establishing of facts. A far greater share of their effort will be concerned with the speculative business of forecasting future output and production efficiency and appraising the "ability to pay" of the companies involved. But the predominant emphasis will be placed upon framing recommendations for settling the disputes in line with announced Government wage-price policy.

In short, the procedure essentially will be one of registering with the public a government opinion as to how far wages may be raised in the cases at issue without raising price ceilings. Both the General Motors and the Oil Panels stated, in quite explicit terms, that this was their conception of the job assigned them.

"Fact-Finding" in Auto and Oil Disputes

As the General Motors Panel phrased it: "This board subscribes to, and has been guided by, the national wage-price policy" — which it summarizes as calling for wage increases to maintain take-home pay at wartime levels, to the degree possible without inflationary price rises.

The Oil Panel was even more forthright in the statement of what it was supposed to do. "In the judgment of the panel," it declared, "the earnings of the workers must be as high as is consistent with both the maintenance of the stability of the price structure and the provision for reasonable returns to the owners of industry." In other words, prices and the return to investors are to remain fixed, with labor entitled to an ever-increasing return up to the limit of what the traffic will bear.

Having thus outlined their respective conceptions of the job, each panel proceeded to carry out its mission.

The Automobile Panel recommended that General Motors increase its basic hourly wage rates by 19½ cents, which amounts to about a 17½ per cent increase on the company's average hourly wage of $1.12. The Oil Panel recommended an 18 per cent increase in basic hourly wage rates, or an additional 21 cents to the average wage rate of $1.20.

The General Motors recommendation was based almost exclusively upon the Panel's calculation that a 19½ cent raise would keep weekly take-home pay equal to that earned in 1944 when the work-week averaged 45.6 hours. The calculation turned on an estimate of what the effective work-week was likely to be in 1946.

The Oil Panel's recommendation appears to have been based on a more complex but no more conclusive accounting. After calculating that the maintenance of July 1945 take-home pay after 40-hour shifts were restored would require a 22 per cent increase in straight-time hourly wages, it recommended that an 18 per cent increase be made. It accounted for 9½ per cent of this by noting that this was needed to cover cost-of-living rises, and explained that the rest was justified by a combination of factors including loss of premium overtime pay, higher productivity, and settlements already negotiated. Since the Panel gave no indication of the weight given to these several factors, it may not be unfair to assume that the last-named was given preponderant importance, since 18 per cent was the increase already granted in collective bargaining by Sinclair and certain other oil companies.

Higher Pay Without Higher Prices

Both panels stated that the pay increases recommended could be met without raising price ceilings, but neither documents its case on this score with very conclusive "facts".

The Oil Panel confined its observations on this account to the statements that only one company in its group had pleaded "inability to pay" and that the industry was in a generally profitable position during 1943 and 1944.

The Automotive Panel stated that, under a number of assumptions about the 1946 operations of General Motors which it believed to be valid, the Company would have higher earnings than it had in 1941, its previous record year. It specifically stated that its findings in the case were not applicable outside the

automobile industry, but it recognized that the General Motors settlement would more or less determine the settlements of other automotive companies. It stated that it had not been able to arrive at a clear conviction as to the ability of other auto makers to pay similar wage advances, but it dismissed the issue by observing that they could expect to operate at full capacity in 1946, and that this should provide savings to offset the increased wage expenditures.

From the management point of view, one of the most serious limitations in the panels' procedure was their failure to deal with any of the Company claims put forward. In ordinary collective bargaining the demands of both sides are advanced and concessions in one direction are traded for concessions in the other. Here, although the companies involved had insisted upon their need for guarantees against contract violations and wild-cat strikes, and for other union concessions, nothing but the wage issue was considered by the "fact-finding" bodies. The General Motors Panel specifically recommended that the wage increase of 19½ cents be granted, but that otherwise "the status quo prevailing before the strike be restored by the reinstatement of the 1945 contract between the parties." Handled thus, fact-finding becomes indeed a wholly one-sided exercise.

Both panels accepted, quite uncritically, the general position taken by Government spokesmen that wage increases are inflationary only if they are directly translated into price advances. It should be obvious that all wage increases add to the inflationary pressure, if made at a time like the present when consumer purchasing power far outstrips the volume of goods and services available to satisfy it.

"Fact-Finding" Dodged in Steel and Rails

It is ironic, too, that even while the Automotive and Oil Panel groups were holding the "government policy" line, the President and his Reconversion and Stabilization Directors were busily at work trying to dent it. In the steel dispute, although price rises in this industry have a particularly sharp inter-industry impact, hearings by the appointed fact-finding board were deferred while negotiations were carried forward by the President and his advisors under which the industry was offered a price increase of approximately $4.00 a ton on condition that U. S. Steel and the United Steelworkers agree upon a mutually acceptable wage boost. It is hard to avoid the cynical conclusion that wage increases constitute the major administration policy, and that the principle of not translating them into increased prices is sacred only in those cases where there can be some reasonably plausible showing that wages may be raised without price advances.

Much the same general conclusion — that the "facts" are controlling only if they support a substantial wage increase — is sustained by the history of the administration of the Railway Labor Act of 1926, often cited as a glowing example of how "fact-finding" by so-called Emergency Boards of Presidential appointees has served to prevent strikes on the railroads. It is true that reports of almost all of the 31 Emergency Boards appointed to look into threatened railway strikes in the 20 years since the act was passed have provided the basis for a settlement of the disputes in question. The fact — a real fact — remains, that in 1941 and again two years later the wage adjustments found appropriate by Emergency Boards in major railway labor disputes were revised upwards at the White House after the unions involved rejected them as unsatisfactory and threatened to strike. The second upward revision was made after government seizure of the railroads to prevent a national transportation tie-up. When the "facts" did not indicate a large enough wage increase to satisfy the union and the Administration, the "facts" went out the window.

It would be irresponsible to deny the importance of finding some tenable solution of current disputes that threaten to completely disrupt the reconversion process. But upon the evidence of experience, "fact-finding" boards cannot be expected to operate according to the common conception of their function — as agencies designed to sift out for the public an objective and significant weighing of the facts behind conflicting claims.

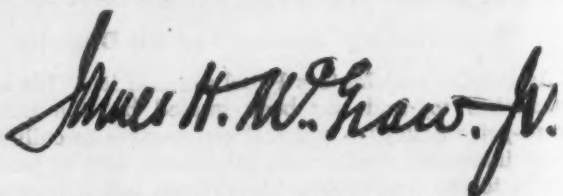
Without Principles Facts Mean Little

Facts, if they are assembled upon a sufficiently partisan basis, can be made to document almost any case one wishes to establish. The major difficulty in marshalling facts to resolve wage disputes is that there are no agreed-upon principles to determine the levels at which wages should be set. In the absence of such principles, it is inevitable that "fact-finding" boards, appointed by the Administration, manned largely by those who helped develop and administer Administration wage policies, and depending for technical assistance upon Administration Departments, will serve merely to implement Administration wage policy.

If Government means to reassert its wartime authority to fix wages — an objective specifically disavowed by the President and seemingly wanted by no one — it should accept the responsibility directly, rather than operate to that end through "fact-finding" boards which are independent in theory, but which cannot be so in fact.

The failure of the brand of "fact-finding" now urged upon Congress by the President is evident. Therefore, we must look for a solution along other lines.

What is needed is for labor and management to agree upon the principles that should govern the determination of wages under free collective bargaining. When such agreement is reached, then and only then, can fact-finding become an objective and useful instrument for settling wage disputes.



President, McGraw-Hill Publishing Co., Inc.

UTAH COMPANY GIVEN DAVIS DAM CONTRACT

Interior Secretary Harold L. Ickes has authorized the award of a contract for construction of Davis Dam on the Colorado River below Boulder Dam to the Utah Construction Co. of San Francisco. The contract calls for expenditure of $21,462,505. Total estimated cost of the project, one of four on the Colorado, is $77,000,000.

The reservoir will have a storage capacity of 1,820,000 acre ft., and five 45,000-kw. generators in its power plant, with a switchyard serving a system of transmission lines and substations which will integrate the Davis power plant with those at Boulder and Parker dams for the movement of energy to pumping loads of the Gila Irrigation Project, commercial markets of central and southern Arizona and the Imperial and Coachella valleys of southern California.

According to USBR Commissioner Michael W. Straus, the dam is "designed principally to generate electrical energy and to regulate the river at the International Boundary . . ." It will store and re-use water released 64 miles upstream at Boulder and will release it a second time in conformity with provisions of the recently ratified water treaty with Mexico.

The project had just been started when it was stopped by WPB in 1942.

● BONNEVILLE Power Administration is seeking use of Seattle City Light facilities to transfer power to B. C. Electric Railway Co., Superintendent E. R. Hoffman reported recently. Hoffman has asked the city council for authority to enter into an agreement with Bonneville, whereby current would be transferred at a point near Arlington, whence it would be carried over a Bonneville line to Blaine, delivery point to the B. C. Electric.

● STEEL PLATES and trusses for a floating caisson to be used in repairing the spillway bucket at Coulee Dam have been received from the American Bridge Co. of Gary, Ind., under a $223,000 contract. Approximately $250,000 in equipment is still to be supplied for the caisson, which probably will not be put into use until fall, according to USBR officials.

● *The Economic Base for Power Markets in Benton and Franklin Counties, Wash.*, is a recent in Bonneville's series dealing with present and future electric power markets in the Pacific Northwest. The area includes the Hanford atomic bomb plant, and effects on population of postwar operation of this plant are calculated.

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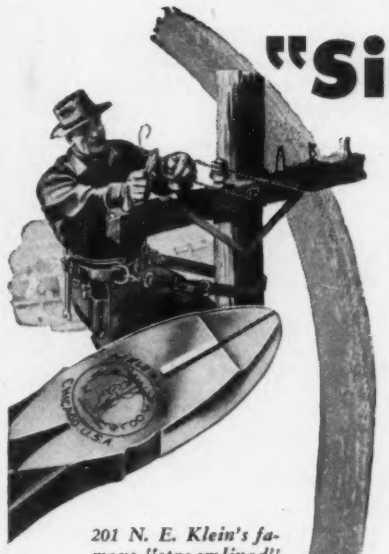

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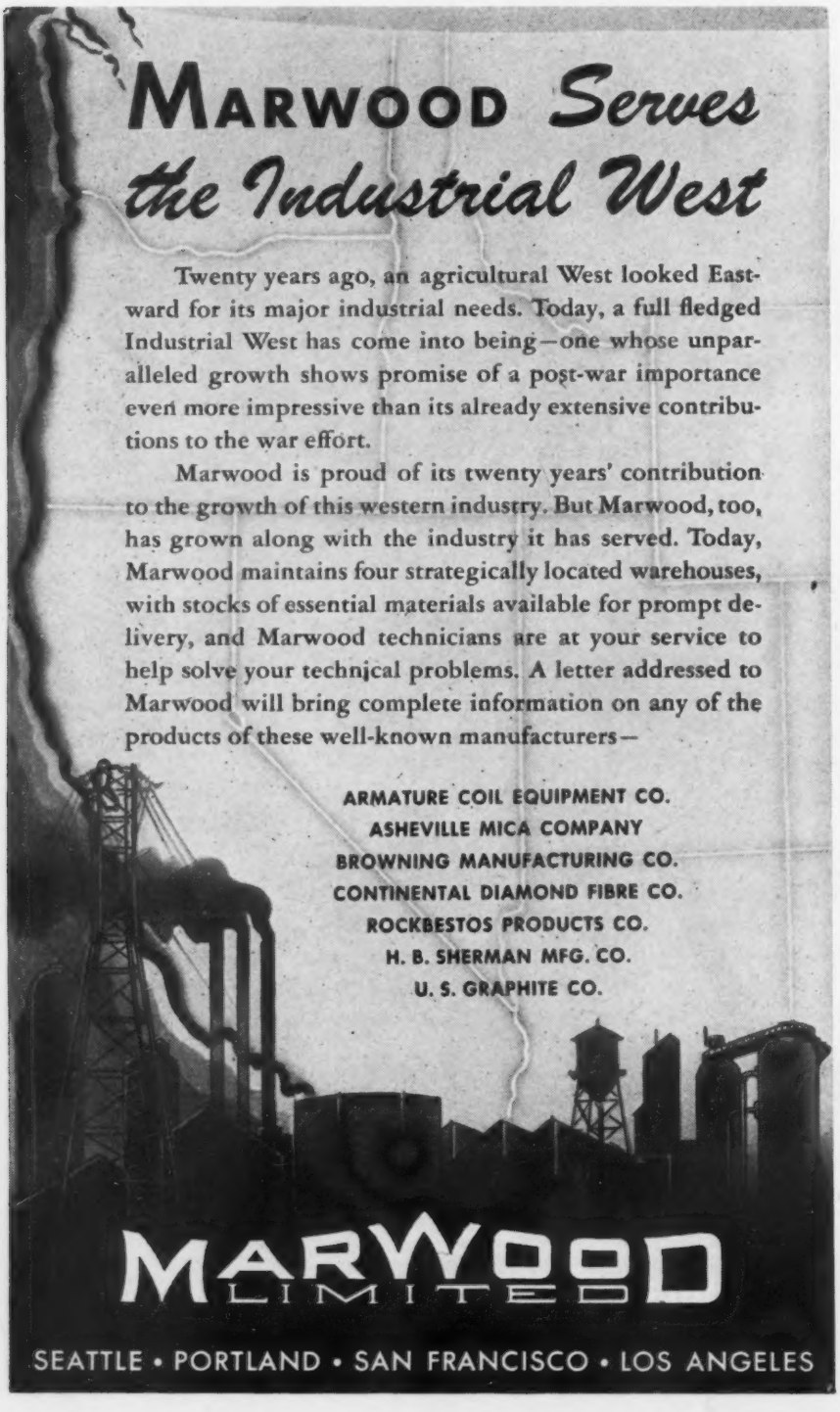
USBR MAKING STUDY FOR DEVELOPMENT IN CHINA

A basin-wide development program for the Yangtze River Valley in China will be designed by the USBR under a contract negotiated by the government of China. Key engineering feature will be a dam larger than Grand Coulee, and development plans provide also for power generation. Design and planning will be done in the USBR Denver office, under general supervision of Chief Engineer Walker R. Young. In direct charge will be John Lucian Savage, until recently chief designing engineer of the bureau and designer of Boulder and Grand Coulee dams. Savage spent several months in China last year preparing the preliminary report on the development. A payment of $250,000 has been made by China to cover initial costs of services of bureau engineers.

● STAR VALLEY in western Wyoming had an 11-hour break in electrical service recently, when Salt River froze in temperatures 30 degrees below zero. The area is served by Lower Valley Power & Light Co., Freedom, Wyo.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BPA WILL TRANSLATE REPORT ON GERMAN LINE

Bonneville Power Administration has been given the task of translating and reproducing a German report on the development, construction, and operation of and experience with a 400-kv. d-c transmission line which extended approximately 100 mi. from the Elbe power station to Berlin.

The report was brought back to this country by Otto Jensen, an engineer for the I-T-E Circuit Breaker Co., Philadelphia. Jensen had been in Europe as a technical industrial intelligence committee investigator for the WPB General Industrial Equipment Division.

The line, over which the Germans successfully moved as much as 25,000 kw., was pretty well destroyed by bombing. Equipment at the transmitting end had been liberated — apparently by the Russians—and very little was available to investigators. Jensen, however, secured the report from one of the leaders in the work on the line. It will be available to all interested parties after BPA has translated and reproduced it, CPA officials said.

● FIRST STEP in a $100,000 street lighting program for Olympia, Wash., was taken recently when Mayor J. T. Trullinger announced that bids had been asked for 128 directional luminaire type lights. The money to pay for the lights, according to Mayor Trullinger, has been accumulated from parking meter funds over a period of five years. Modernizing of the city's lighting system will be completed when labor conditions become more favorable and when equipment is available.

● USBR was to open bids Feb. 11 on construction of a 56-mi., 230-kv. steel-tower transmission line from Oroville to Sacramento, Calif., for distribution of Shasta and Keswick power. The line is the second of three contemplated, the first being the Shasta-Oroville line. It is expected to be tied in with facilities in the San Joaquin Valley to furnish power for irrigation pumping. An appropriation of $780,000 for the line was made by Congress in December.

● CONVERSION of approximately 25 miles of existing street car lines to trolly bus routes, was one of the recommendations of three transit consultants, at the recently held Los Angeles transportation clinic. The three experts, Harold M. Lewis, New York, Charles De Leuw, Chicago, and Joe R. Ong, Cincinnati, were employed by the city, at a cost of $35,000, to make surveys and recommendations.

TRADE notes

Triangle Pacific Moves Kaufman to San Francisco

C. H. (Ponzi) Kaufman, general manager of Triangle Pacific Co., has taken over active management of the San Francisco branch office, moving from Los Angeles to northern California.

Gordon F. Black, who has been with Triangle in San Francisco for the past year, will assist Kaufman.

Announced recently was appointment of Triangle Pacific as West Coast representative for Rome Cable Corp., Rome, N. Y. Stocks of wire and cable will be maintained at each of the Coast branches. The company also represents Philco Corp., storage battery division; Mica Insulator Co.; Dow-Corning Corp., is distributor for Owens-Corning Fiberglas Corp.

● Radio Television Supply Co. of Los Angeles has announced appointment of Jack Moulthrop as vice-president and general manager to replace Mitchell Hirsch, who retired due to illness. Moulthrop has acquired a substantial interest in the company, it was stated. He has been in the radio parts business for more than 20 years. For the past ten years he has managed the electronics department of Leo J. Meyberg Co.'s San Francisco division.

● William H. Robinson Jr., manager of the advertising division of General Electric's lamp department, recently conferred with members of the electrical industry in Seattle, discussing the future of industrial and home lighting.

● General Appliance Co., San Francisco, has moved its office, display room and service shop to 430 Octavia St. Carl O. Hagstrom is general manager, Carl E. Holm, service manager, of the company, which handles General Electric, Easy, Bendix, Ironite and Norge.

● Ray Ridgley and Ray Fidler have opened for business in Abbotsford, B. C. They will specialize in the construction of built-in-refrigeration and freezing and cold storage service for farms and warehouses.

● R. Kwasnoski and K. H. Meadow have filed partnership in the business of Heating & Appliance Specialities at 1051 Granville St., Vancouver, B. C.

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MALLORY CAPACITORS

Necessary leads, lugs, screws, and nuts are included in each box for any type connectors.

Mallory MSG Capacitor:—Small, compact AC Motor Starting Capacitor that fits almost every mounting bracket or box. Replaces rectangular capacitors with leads, lugs or studs. Each capacitor is packed with complete set of universal mounting hardware and installation instructions.

Mallory Type "P" Capacitor:—Plastic case overcomes moisture absorption problems, and provides maximum insulation. May be used to replace cardboard insulated aluminum-case capacitors. Splash-proof plastic end cap and simplified "snap on" mounting bracket available when capacitor is used as original equipment.

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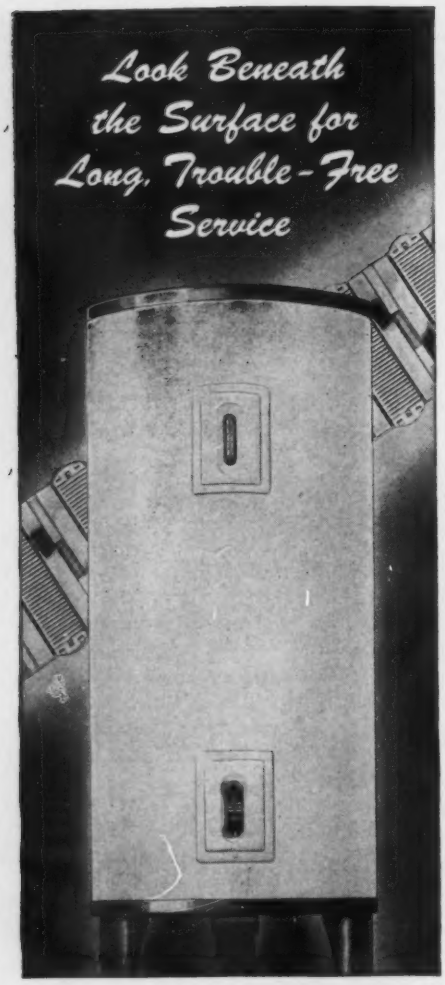

Just as you "cannot judge a book by its cover" neither can you predict the kind of service an electric water heater will give by its outer shell—it is what is underneath that counts. If you compare the inner construction of a Clark with that of other water heaters, you will find many little differences in material and design. But the big difference, the feature that guarantees long, faithful service is the famous Clark "Lifesaver" Element. If you are planning on merchandising electric water heaters you will find it well worth your while to get the facts about this time-tested feature found exclusively in the Clark. Our brochure "In a Nut Shell" is yours for the asking — may we send it to you?

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A. B. Chance Purchases Bowie Switch Co.

Purchase of the Bowie Switch Co. of San Francisco by the A. B. Chance Co., Centralia, Mo., manufacturer of pole line construction and maintenance equipment, was announced recently. The West Coast company will be known as the A. B. Chance Co., Bowie Switch division.

A. J. Bowie, who founded Bowie Switch in 1926, will be retained as consulting engineer, according to President F. G. Chance. Bowie was an engineer for the city of San Francisco before he went into business for himself. He holds a number of patents on switch gear.

J. T. Isbell, vice-president in charge of sales for Chance since 1939, has been named vice-president and Pacific Coast manager. J. A. Martin will be transferred from the Centralia plant, where he is superintendent, to San Francisco as plant manager.

Chance stated that the company plans to expand manufacturing facilities of the Bowie plant to make some A. B. Chance Co. products for Western consumption. Warehouse facilities will be used also for equipment manufactured at the Missouri plant.

Bowie manufactures a complete line of switches, built the 287-kv. air break switches for Boulder Dam and has furnished switches for other large hydroelectric projects.

● SQUARE D Co., manufacturer of electrical control equipment, is starting a national campaign to tell the advantages of multibreaker control in the home. The manufacturer is displaying home multibreakers in all power and water departments, model homes and other places where they will be seen by home owners and builders. In addition a four-color descriptive folder has been designed especially for the campaign, and tells in layman's language the story of the device.

● D. H. SLUMAN & Co. has been named Rocky Mountain district representative for General Mills' new home appliance department, according to announcement by Roscoe E. Imhoff, department manager. Donald H. Sluman is owner and manager of the firm, which has offices at 7700 W. 13th Ave., Denver.

● APPLIANCE WHOLESALERS of Salt Lake City is a new firm in the Intermountain area. Partners in the business are Walter B. Lloyd, V. A. Smith and Reed E. Vetterli. Operating now at 307 S. Fourth E., the firm will be moved about March 1 to headquarters now being constructed at 850 S. Main. Among lines carried are Admiral, Automatic Washer, Cadillac vacuum cleaner, Manning-Bowman small appliances and Vaculator.

Isbell

● JOHN MADDOX, Pacific Coast representative for Railley Corp., has announced appointment of W. G. GORDON in the Seattle area, with offices at 619 Second Ave. Gordon was with Seattle Lighting Fixture Co. for a number of years before becoming a manufacturer's representative.

● HELWIG Co., manufacturer of carbon products, on March 1 will move its Los Angeles office to larger quarters at 611-613 W. Pico Blvd., Los Angeles 15, it was announced by W. O. Helwig. F. S. Fletcher is in charge of the office.

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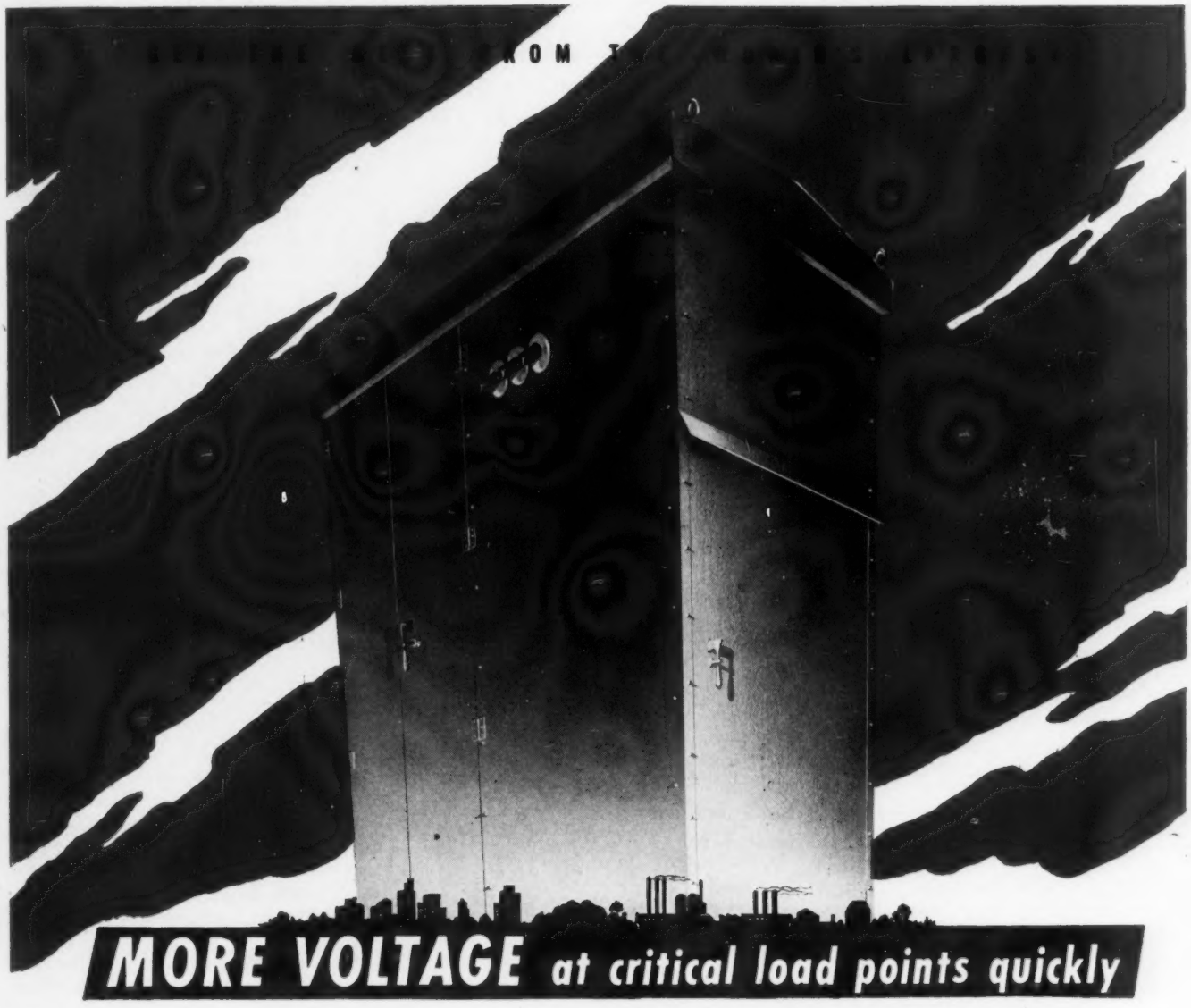
H. Geo. Shefler, P.O. Box 1587.....Phoenix



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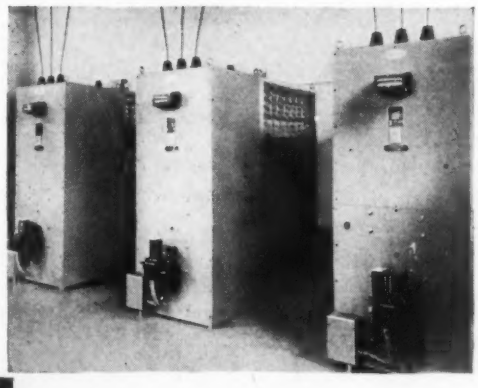

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These 720 Kva, 4160 volt, 3-phase, 60 cycle Dykanol "A" indoor station-type capacitors are installed in the substation of a large Eastern utility. They are automatically switched by voltage control.

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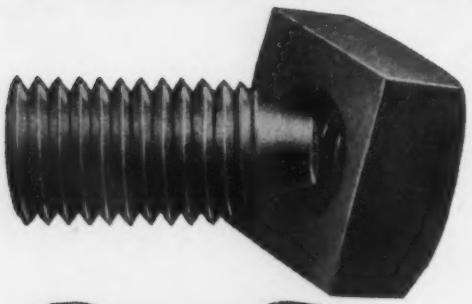

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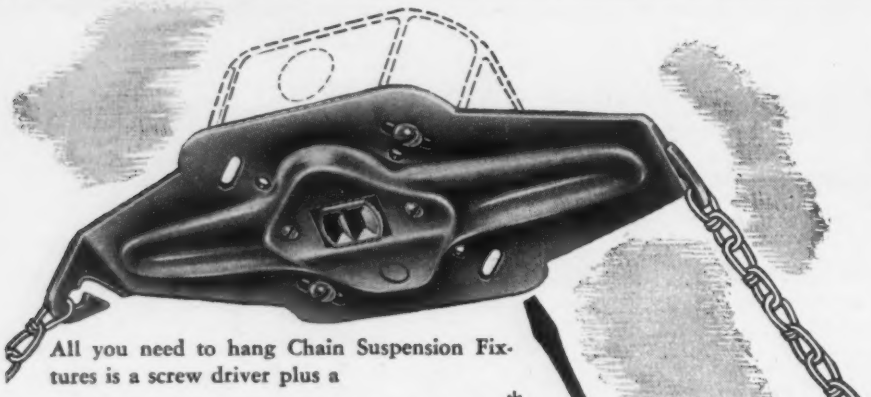

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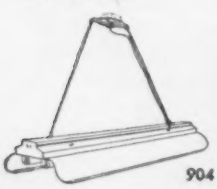
*Patent No. D-141024. Others pending. Underwriters approved.



904

IT'S EASY TO SEE WHEN IT'S

DAY-BRITE Lighting

McCone Succeeds Moore as Joshua Hendy President

John A. McCone last month became president of Joshua Hendy Iron Works, Sunnyvale, Calif., succeeding Charles E. Moore, who retired to devote more time to other business. Moore's interest in Hendy has been purchased by McCone, S. D. Bechtel, K. K. Bechtel, Felix Kahn and associates, who, with Moore, acquired the company in 1940.

McCone has been associated for many years with heavy industrial goods manufacturing, has been executive vice-president and general manager for Consolidated Steel Corp., a participant in various businesses with S. D. Bechtel.

Moore, who is president of the Moore Machinery Co. of San Francisco, will continue his machinery and building interests in the Bay area.

Hendy manufactures turbines, diesels, hydraulic controls, gates, valves and mining equipment.

● CONSTRUCTION of a $225,000 radio assembly plant at Riverside, Calif., is scheduled by Colonial Radio Corp., of Buffalo, N. Y. which has awarded a contract for the 280 x 190-ft. fireproof structure to be erected on Kansas Ave. Between 180 and 200 workers will be employed there, on assembly of sets from parts fabricated at the company's Bloomington, Ill., plant. Sears Roebuck will be Pacific Coast distributor.

● ACE ELECTRIC, San Diego, is reengineering the electric distribution system of the Border Light & Telephone Co. of Tia Juana, Mexico. The work, which is estimated at $30,000, consists of installation of a primary and secondary distribution system, including rewiring and replacement of poles where necessary. V. T. Heinz is owner, A. W. Meyer, superintendent-engineer of Ace Electric.

● A. H. WITT, former sales manager for Drayer-Hanson, Los Angeles refrigeration and air conditioning manufacturers, has gone in business for himself under the firm name Witt Coils. Located at 767 E. Pico Blvd., Los Angeles, he will handle a line of commercial refrigeration coils and water coolers, selling through jobbers only.

● THROUGH ERROR, the new address of FLUORESCENT FIXTURES OF CALIFORNIA was incorrectly printed in the December ELECTRICAL WEST. The correct address is 819 Ellis St., San Francisco 9. Ernest O. Anders is manager of the firm of manufacturers and designers.

Eric Johnston Announces Profit Sharing Plan

Eric A. Johnston has announced a profit-sharing plan for employees and management of Brown Johnston Electric and Columbia Electric & Mfg. companies of Spokane, which he heads. Under the plan which went into effect Jan. 1, employees who have been with either company one year or more will share approximately 25% of the net profit before taxes on a point system.

Each employee will receive one unit of credit toward the bonus for each $100 annual earnings, one unit for each year of continuous service, five units for each term served on the junior board of directors (appointed in connection with the plan), five units for a supervisory position, 25 units if a department head or 15 units if an assistant department head. Value of the units will be determined each year by dividing the amount of money to be shared by the total units credited to employees.

The management appointed the first junior board of directors for a six-month term. Henceforth, the board will be elected annually by the employees. The seven-man board will advise with management on such subjects as labor relations, improvements and general problems.

● C. R. HUNT, San Francisco, West Coast representative for Robbins & Myers, Inc., has announced that REYNOLD MEUSSDORFFER, formerly with the manufacturer in Springfield, Ohio, and more recently with the Hunt organization, is opening an office at Los Angeles. The new office will be under direction of the San Francisco organization, and activities will be devoted to electric motors and fans.

● IN A PROGRAM for expanding its facilities the Power City Electric Co., electrical contractors at N. 938 Howard St., Spokane, has purchased a three-story building at Howard and Cataldo. The building will be remodeled for occupancy of the business at an estimated cost of $15,000, Peter DeFeyter of the company has announced.

● LEE LETHINE, for many years with Anaconda Wire & Cable Co., in San Francisco and later Los Angeles, has joined the firm of Phillips & Edwards Inc., as a partner and returned to San Francisco. Phillips & Edwards is a wholesale electrical supply house established before the war by Al Phillips and C. W. Edwards, formerly with Incandescent Supply Co. The facilities and warehousing space of the company at 1035 Harrison St., San Francisco, are being enlarged with an addition at the rear.

● INSIDE WORKINGS of a network musical show are given in a sound motion picture, *Music in the Sky*, produced by Westinghouse and available in 16 or 35 mm. The film features the company's Sunday musical show starring John Charles Thomas, John Nesbitt and others. It may be secured free except for transportation costs. Requests should be sent to the Westinghouse Motion Picture and Speaker's Bureau, 306 Fourth Ave., Box 1017, Pittsburgh 30, Penn.

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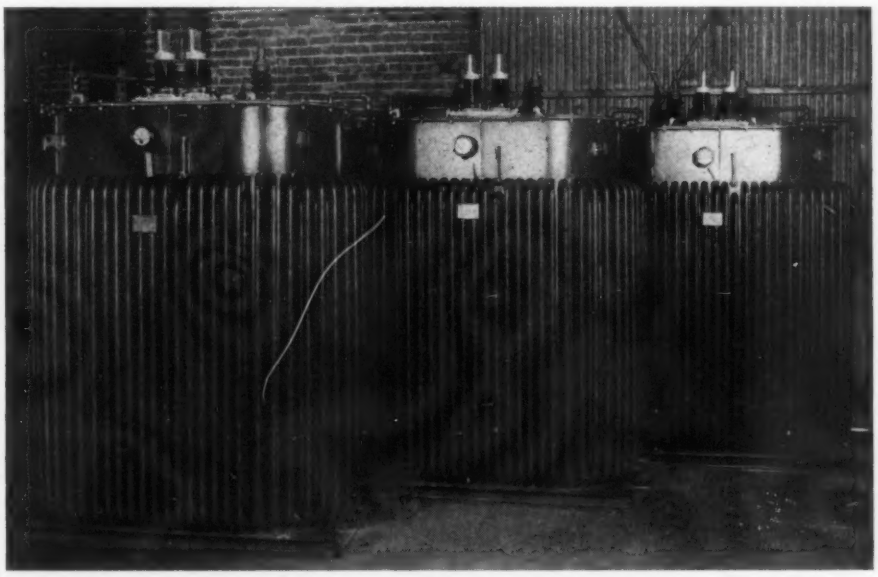

3—1000 K.V.A. Transformers recently supplied to an automotive firm at South Gate, California

Gardner Transformers GUARD PROFITS

Your costs are reduced, your interests protected in two ways:

First—Gardner transformers have high internal operating efficiency. Their design keeps core and copper losses to a minimum, conserves current for production.

Second—correct voltage is delivered for top efficiency and long life of your electrical tools and equipment. Ratio taps allow adjustment of voltage made necessary by transmission line resistance and reactance. Special taps provided to meet unusual conditions.

You can feel secure with Gardner transformers. They are engineered to guard your profits.

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West Coast Representative
MAYDWELL & HARTZELL
INCORPORATED
San Francisco Los Angeles Portland Seattle

Insist on
"ADVANCE" BALLASTS
on all lighting equipment
YOU buy

"ADVANCE" BALLASTS EXCEL IN QUIET OPERATION, high efficiency performance, low replacement cost and long life. They permit easy installation in fixtures where only a limited space is allowed for ballasts. Designed by expert lighting engineers and approved by Underwriters' Laboratories, "Advance" ballasts are the answer to all fluorescent lighting problems. LARGE MANUFACTURERS OF LIGHTING FIXTURES USE "ADVANCE" BALLASTS—so insist on this quality ballast on the equipment YOU buy.

DEPT. EW

ADVANCE Transformer Co.

1161 W. Madison Street Chicago 7, Ill.

MODERN ALCHEMIST

...producing the world's foremost resistance alloy!

Nichrome*

This modern metallurgist is alloying nickel and chromium to produce the world's foremost heat and corrosion resistant alloy—Nichrome!

But it takes more than the combining of nickel and chromium to produce the superior properties of genuine Nichrome—it requires certain exclusive D-H techniques combined with precise metallurgical checks and controls from furnace to spool, and the specialized experience of 46 years of continuous alloy research. These are the quality controls that have established Nichrome as the time-tested standard by which other alloys are measured.

Though there are other excellent nickel and chromium combinations, there is *only one* Nichrome—and it is made *only* by Driver-Harris. Thus Nichrome is at once the registered Trade Mark and symbol of service belonging wholly and solely to the Driver-Harris Company.

Nichrome is made only by

*Trade Mark Reg. U.S. Pat. Off.

Driver-Harris COMPANY

Stocked for the Coast Trade at: ANGUS-CAMPBELL, INC.

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Main Office and Plant: HARRISON, NEW JERSEY

● HOTPOINT's Pacific Coast organization has just been announced by Howard J. Scaife, Western regional sales manager, whose headquarters are in the Western Merchandise Mart, 1355 Market St., San Francisco. E. J. Baughman, district sales manager for southern California, Arizona, New Mexico, has with him Rolland Cass as service manager for that area and Utah, located in the Los Angeles Chamber of Commerce Bldg. W. E. Garrison is product and service manager for northern California, Washington, Oregon, Idaho and Montana, operating from the San Francisco office. H. E. Silvernail, formerly of General Foods, is office manager and in charge of sales promotion. John McDaniel has just been appointed district manager for the Northwest, with offices in Seattle, to succeed Joe Platt, who resigned to affiliate with Mitchell Lighting Co.

● SYLVANIA ELECTRIC PRODUCTS' Pacific Coast Sales Manager George R. Sommers toured the West to present Robert Bishop, general sales manager for lighting, at a series of jobber and distributor executives meetings beginning Jan. 29 at the Town House, Los Angeles and including one at the Mark Hopkins, San Francisco, Feb. 1, another the Benson, Portland, Feb. 4, and the Olympic, Seattle, Feb. 7. The company's enlarged program, its relationship with its new acquisitions, the Birdseye and Wabash lamp companies, and sales plans were to be discussed by Bishop.

● MOUNTAIN STATES DISTRIBUTORS, a new electrical wholesaler and distributor firm, has been established in Salt Lake City at 32 Exchange Pl. E. E. Pritchett is president and manager. The company will handle ABC washers and ironers, Thermador electric ranges, water heaters and space heaters, Lear radios and recorders, and other lines.

● T. A. VALLE, for 16 years with Utah Power & Light Co., has gone into business for himself as a partner in the firm of Chapman-Valle. The new firm is located at 235 S. Fifth E., Salt Lake City, and will handle electrical appliances and plumbing fixtures and supplies.

● AN ERROR was made in reporting the change of address of the Division of Industrial Safety in San Francisco. It is located in the Balboa Bldg., at 593 Market St., zone 5, instead of the Balfour Bldg.

● G. STEVEN and G. CAMPBELL are now partners in the business of the Atom Electric and Radio, 2241 East 12th Ave., Vancouver, B. C.

PEOPLE

made this news

● A. L. JONES, General Electric commercial vice-president, Denver, has retired after more than 41 years with the company. In addition to their present districts, R. M. ALVORD, San Francisco, has been assigned Salt Lake City and surrounding territory, A. S. MOODY, Portland, will take the Western territory as far east as Butte, and W. B. CLAYTON, Dallas, well cover the Denver area. The new set-up affects only the executive department. Present sales territory will remain under existing district management.

● JACOB A. KAHN, commercial vice-president, General Electric Supply Corp., Salt Lake City, retired last month after more than 27 years with the company and its predecessors. He was president and manager of the Capital Electric Co., when it was taken over by G-E Supply.

● NEW APPOINTMENTS in the Portland office of General Electric Supply, announced by S. S. Brundige, manager, effective Jan. 1, are: E. J. PARSON, manager of appliance sales division; S. H. GOODMAN, manager of supply sales division; M. T. WALL, sales manager of radio.

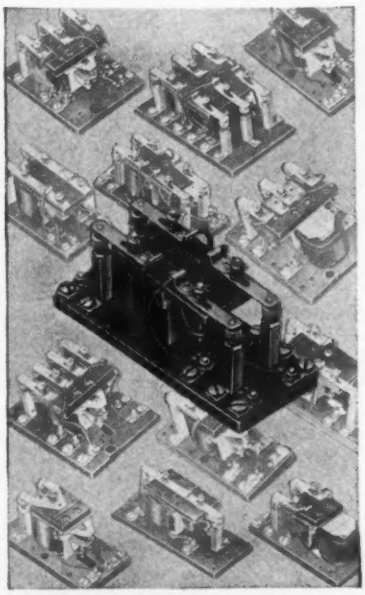
● LOU BURDICK, who has been district manager for General Electric Supply Corp. at Butte, has been transferred to Denver as district manager to fill the vacancy made by the death of the late Will Smith. J. L. FAHEY, formerly operating manager in the Salt Lake City division office, goes to Butte as district manager to succeed Burdick.

● HARRY B. ROGERS, Spokane manager for General Electric Supply, retired from active duty on Jan. 1, but will remain for one year as consultant. Rogers has been with G-E for 32 years.

● EDMUND Z. COMAN, with G-E Supply for 22 years, has been appointed Spokane manager to succeed Rogers. N. E. SHIELDS has taken over as supplies sales manager.

● LYNDON W. CLIFFORD has moved to Hawaii as electrical sales development councillor for Hawaiian Electric Co. With Westinghouse for 22 years, Clifford worked with Hawaiian Electric for four months in 1941, when he represented the refrigeration specialities department of the Westinghouse plant at East Springfield, Mass.

A NEW IDEA



BULLETIN 130 RELAYS

The Bulletin 130 relays offer the user the choice of one to four poles, 6 to 230 volts D. C. and 6 to 440 volts A. C. in single or double throw, normally open or closed, with or without blowout coils and a host of other options. With such flexibility of arrangement, custom requirements can be met without prohibitive cost or undue delay in delivery.

Send for Bulletin No. 130 giving full particulars of this line of Relays. In it you will find relays that exactly meet your requirements.

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RELAYS • RESISTORS • RHEOSTATS

Electric control devices since 1892

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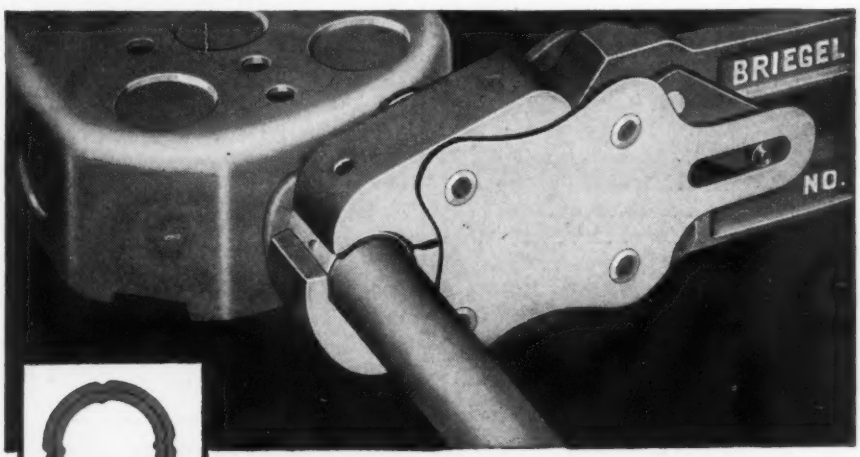
OFFICES IN PRINCIPAL CITIES



Cross section Showing Indentations.

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Two Squeezes and it's Set

TWO QUICK SQUEEZES give you Finer, Faster Conduit Connections. B-M Fittings do away with the twisting, turning and tightening of nuts and save you valuable time and materials. Then too, they are stronger, neater and much easier to work with in tight places. Start using B-M Fittings today. Have more satisfied customers—more profits from each job!

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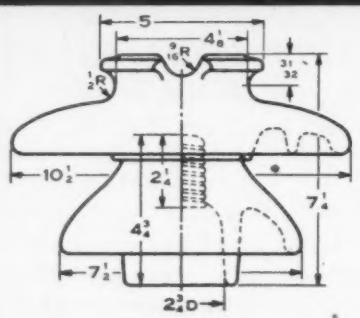
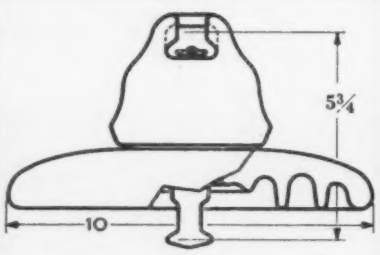
THOMAS
PORCELAIN
INSULATORS



NO. 2124-M
45 Kv. Rating

Dry Flashover . . . . . 125 Kv.
Wet Flashover . . . . . 85 Kv.
Rec. Pin Height . . . . . 8 In.
Std. Pkg. Crate 6

This insulator generally used on 33 Kv. can also be furnished in one-piece design (No. 1924). Mechanical, thermal and electrical characteristics are well balanced insuring long life in service.



NO. 21243
15,000 Lb. Min. Combined M. & E. Rating

Dry Flashover . . . . . 80 Kv.
Wet Flashover . . . . . 50 Kv.
Leakage Distance . . . . . 11½ In.
Std. Pkg. Crate 6

This design is offered in a wide range of spacings in both Ball-Socket and Clevis types which fulfill all strain insulator requirements.

Service records prove these units will serve faithfully under all conditions. Call our nearest sales representative for speedy delivery.

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THE R. THOMAS & SONS CO.
LISBON, OHIO

● DAVID N. REED, returned from military service, is back with PG and E and has taken over as Stockton sales manager. Reed formerly was a sales supervisor at San Francisco. Other shifts in divisional sales personnel announced by PG and E include transfer of DAVID F. NOCK, acting sales manager at Red Bluff, to Chico as sales manager of the De Sabla division. He replaces W. L. GREER, who goes to the Sacramento division as sales manager. DOUGLAS S. AIKEN, recently discharged from the Navy, will resume his position as sales manager at Red Bluff.

● E. W. FLORENCE, manager of the Sacramento, Calif., division of Pacific Gas and Electric Co., retired Jan. 1. He had been with the company and its predecessors for 45 years. He started at Chico in 1901, was transferred to Fresno in 1909, to San Mateo in 1911, to Sacramento as manager in 1921.

● L. J. BRUNDIGE, former Chico division manager for PG and E, has replaced Florence in the Sacramento division, and W. R. BOWLER has been transferred to Chico as manager.

● ART MILLER, merchandise manager for both gas and electric appliances for Pacific Gas and Electric Co., has returned to his job after serving for three and a half years as officer in charge of procurement for the 9th Service Command, in San Francisco. He was made lieutenant-colonel shortly before his release from service.

● LT. COMDR. THOMAS N. HUNT has returned to Washington Water Power Co. as division sales manager. His responsibilities include residential, commercial and industrial sales in Spokane, and promotional contracts with allied electrical trades. In the Navy, Hunt served with a ship repair unit, last stationed on Guam.

● GEORGE A. WHITLEY recently resumed his position as division plant superintendent at Coeur d'Alene, Idaho, for Washington Water Power Co., after serving as lieutenant-colonel in Pacific battle areas. He is also a veteran of World War I.

● ROBERT T. PAINE has been appointed district manager for Washington Water Power Co. at Colville, Wash., replacing H. R. Williams, who retired.

● WILLIAM R. FRAMPTON, electrical and mechanical engineer for Southern California Edison Co., after 40 years of active service, retired Jan. 1.

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Scientifically built to link electrical energy in your products.
Economical . . . dependable quality all ways.
Pure copper drawn to size in the ILSCO plant to insure precision.
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The States Company
Test Blocks and Meter Testing Equipment
R. Thomas & Sons Co.
Pin-type and Suspension Insulators
Electroline
Wire Rope Fittings

● FRANK A. BALLMAN has joined Thermador at Los Angeles as general sales manager. A major in the air force, he was engaged in sea, air and jungle rescue work and was awarded the Bronze Star. Before the war, he was with Firestone Co. of California; at the time of his enlistment was merchandise manager for home and auto appliances.

● WILLIAM LUJAN is sales representative in charge of Motorola radios in the Rocky Mountain area, with headquarters in Denver. He formerly was sales manager for the Central Supply Co. radio department at Denver.

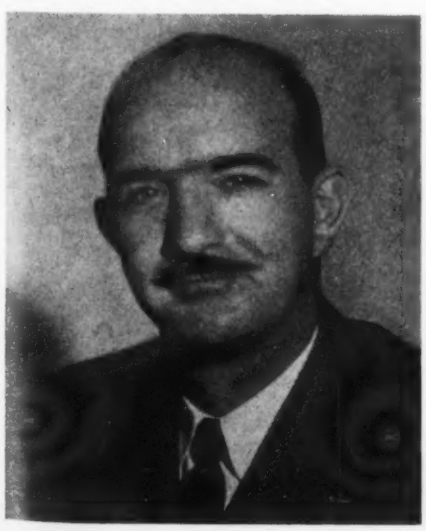
● CARL O. MARTIN, since 1916 Benjamin Electric Mfg. Co. representative at San Francisco, has been made assistant manager of the Pacific Coast division. His headquarters will remain at San Francisco.

● WILLIAM J. BERRYMAN succeeds R. W. BUTLER as Salt Lake City branch manager of the Mine & Smelter Supply Co. Butler has been promoted to general auditor, with headquarters in Denver.

● CLYDE E. ALLEN, recently became Pacific Coast sales manager for the Tru-Ad division of Mitchell Mfg. Co., with headquarters in Los Angeles. A Californian, Allen has had his entire business career on the West Coast, having held managerial posts with Graybar, Hotpoint and Electric Kitchen Appliance Co.

● JOE PLATT is Northwest district manager for Tru-Ad division of Mitchell, with offices at 1411 Fourth Ave. Bldg., Seattle. Platt was Hotpoint district manager for about 18 years and is well known to the industry in the Northwest area.

Allen



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AT LESS COST
The unequalled performance of TRICO "Powder-Packed" Renewable Fuses, Kantark "One-time" Fuses, Kliplok Clamps for fuse clips, Fuse Pullers, and visible, automatic Oilers for all types of bearings, is proved in thousands of standard and special applications—helping users to produce MORE — BETTER — FASTER and at LESS COST!
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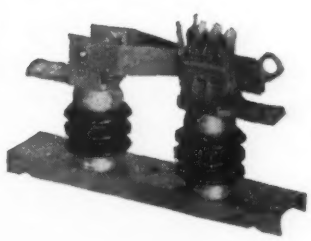
COLE ELECTRIC CO.
Disconnecting Switches



Earl S. Condon Co., represents: UNITED STATES RUBBER CO. Wire and Cable Div. • LAPP INSULATOR CO., INC. • BURNDY ENGINEERING CO., INC. • COLE ELECTRIC CO.

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Time Switches

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Complete stocks at these points

LOS ANGELES SAN FRANCISCO
PORTLAND SEATTLE

● LT.-COL. ERVIN H. CLAUSEN has returned to Johns-Manville and resumed his position as San Francisco district manager, heading activities in northern California, Nevada, Idaho, Utah and the Hawaiian Islands. Other West Coast appointments announced by the company include: W. A. DEAL, assistant district manager; T. S. TULIEN, Pacific Coast staff manager, industrial department; M. E. SWEENEY, Pacific Coast staff manager, buildings materials department; L. W. RICHARDSON, Pacific regional manager, contract buildings materials section. All have headquarters in San Francisco.

● S. B. ROBINSON has resigned as chief assistant city attorney for water and power at Los Angeles. For 40 years with the Los Angeles Department of Water & Power, he was the city's attorney on the litigation with the Los Angeles Gas & Electric Corp., handled the Owens Valley water rights litigation and was a member of the group which worked on revision of the Colorado River Basin sections of the Boulder Dam Act. He will continue for a year as special counsel to the city attorney on water and power matters.

● LOUIS G. BERGER has been named southern California district manager for Westinghouse Supply, with headquarters at Los Angeles, taking over some of the duties of Vice-President B. S. Manuel. Manuel will continue to have over-all responsibility for operation of the district. Berger had been assistant district manager since February 1945.

● ARTHUR J. REYNOLDS has taken over the dealer sales promotion work for Utah Power & Light Co. in the Salt Lake division, succeeding T. A. Valle, resigned. With the company about 16 years, Reynolds has recently been supervisor of the customer service department.

● H. L. PERCY, who during the war was salvage official for WPB, is now general sales manager for Flint Distributing Co. at Salt Lake City. He entered the appliance field in 1925 with Kelvinator.

● A. HIPSHMAN is West Coast sales manager for Ray-O-Vac flashlight batteries. Headquarters are in San Francisco.

● RALPH G. DABADIE has been appointed manager for Meyers Safety Switch Co., San Francisco.

● MRS. PHILIP FARIS has joined Harper-Meggee as home service director for the Spokane area.

HELWIG SPEER
Carbon Products

BRUSH KITS OF ALL DESCRIPTIONS
CARBON BRUSHES OF ALL DESCRIPTIONS

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EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

Lee

● W. E. LEE has been promoted to manager of the Westinghouse Phoenix office. With Westinghouse at Butte, Las Vegas, Salt Lake City and Los Angeles, Lee since April 1945, had been sales engineer in the mining industries at Phoenix.

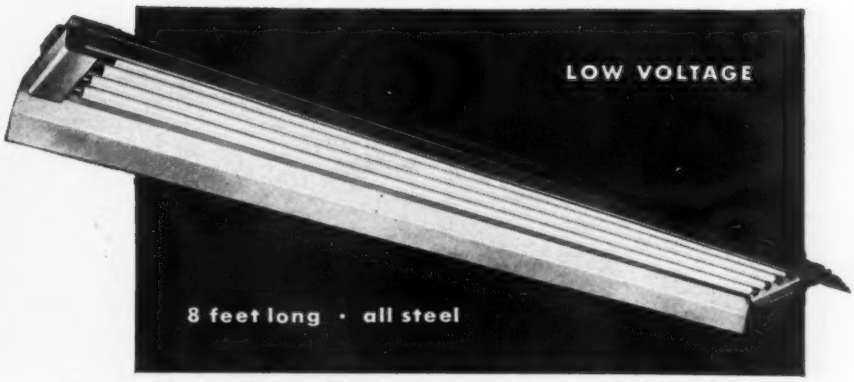
● BRADFORD ROSS of Cheyenne, Wyo., has been appointed general counsel of the Federal Power Commission, filling a vacancy which has existed since the resignation of Charles V. Shannon last July 1. It is anticipated that Ross, who presently is a lieutenant colonel and deputy director of the Internal Security Division of the Provost Marshal General's Office, will be released from active Army service shortly and that he will take over the FPC job immediately. Ross was graduated from the George Washington law school in 1936, practiced in the District of Columbia for three years before returning to Wyoming in 1939, to enter practice in Cheyenne. He was a member of the Wyoming legislature in 1940.

● JAMES K. CARR has been named engineer for the USBR's newly formed Sacramento Valley district, embracing an area in California from Knights Landing to Shasta Dam. The district will be under Regional Director Richard L. Boke, and headquarters will be at Chico.

● FRANK E. BUCK, president of Golden State Co. Ltd., has been elected to the board of directors of Pacific Gas and Electric Co.

● H. S. DUSENBERY, formerly in the electrical department of Moore Dry Dock Co., is teaching electrical engineering at the University of Santa Clara.

*COLOVOLT COLD CATHODE INDUSTRIAL FIXTURES



Here is the new Colovolt industrial fixture, one of a complete line of industrial and commercial "packaged" units. Equipped with the standard 93" Colovolt 10,000 hour lamp, Colovolt fixtures may be used singly or in continuous line lighting in multiples of 8 feet. Instantaneous starting, no flickering, guaranteed for 1 year except for failure due to breakage are extra advantages of the Colovolt Cold Cathode low voltage fluorescent lamp. The long life expectancy of Colovolt lamps may be realized even when constantly turned on and off, and *pre-scheduled re-lamping, with no loss of production or time, is now possible with Colovolt installations.*

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In the electrical wiring of factories, homes, public buildings, etc., leading electrical contractors are using millions of IDEAL "Wire-nuts" because they make wire joints that are neater, safer, quicker, better electrically—stronger mechanically. IMMEDIATELY AVAILABLE . . because no critical material used. Approved by Underwriters' Laboratories, Inc.

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Today and Tomorrow thousands of new wiring jobs in Industrial Plants and in construction will be facilitated with IDEAL Wiring Devices:—

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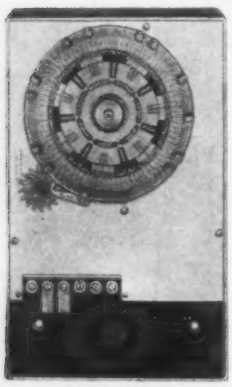
LET "MR. TOPS" CONTROL YOUR TIMING of

***Automatic* HEATING, VENTILATING, LIGHTING, PUMPING OR FLUSHING OPERATIONS . . .**

Paragon 700 Series Time Switches are equipped with 6" calendar dials which make one complete revolution every 7 days. Dial trippers can be independently set for different daily ON and OFF schedules. Settings can be made in advance for an entire week. Any day or days operations may be omitted entirely on a pre-set program.

Each day of week clearly separated from other days; graduated into hours and half hours; day and night distinctly separated. Operations from ON to OFF or from OFF to ON can be set as close as three hours apart and can be separately adjusted throughout each 24 hour day in the week.

Write for a complete bulletin.



Paragon 700 Series Time Switch

PARAGON ELECTRIC COMPANY
736 Old Colony Building
Chicago 5, Illinois

Paragon Chicago
BUILDERS OF ELECTRICAL EQUIPMENT SINCE 1905

● I. L. COMSTOCK has been made internal auditor for Pacific Public Service Co., in San Francisco, holding company of Standard Oil Co. of California for its gas and electric utilities. He transferred from Coast Counties Gas & Electric Co., the subsidiary. Prior to that he had been with Montana Power Co. at Butte as commercial manager.

● MAJOR NORMAN L. BOST, who has been in the Army communication service for 18 months, was expected to be discharged in January and to return to Seattle as manager for National Electric Products Corp.

● HARLEY SROUFE, who has been Nationel Electric Products' Seattle manager in absence of Major Bost, will be transferred to Portland as manager.

● N. G. AYYANGER, chief engineer for irrigation of the government of Madras, India, visited Coulee Dam recently to study the development. He said that a similar project will be started in India within a year or two.

● N. A. (Burt) MURPHY will have charge of apartment house and new building operations for General Electric's Los Angeles appliance distributing branch.

Deaths

William G. Vincent, 64, vice-president and executive engineer of Pacific Gas & Electric Co. and for 40 years actively identified with electrical circles in California, died at his home in San Francisco on Jan. 29. He had been ill since the middle of December.

W. G. Vincent

ALL the strength and durability inherent in steel are combined—with definite economies—in *Crapo* Galvanized Steel Strand. Heavy, ductile, tightly-bonded zinc coatings, applied by the famous *Crapo* Galvanizing Process, provide lasting protection against corrosion.

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MUNCIE, INDIANA

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Mr. Vincent was born in New Orleans, La., and was graduated with a mechanical engineering degree from Tulane University in 1902. After his graduation from Cornell University in New York as an electrical engineer in 1904, he joined the Telautograph Co. in San Francisco, later engaging in work with the University of California Light and Power Department. In 1911 he joined the J. G. White & Co., which was currently engaged in making a valuation survey of Pacific Gas and Electric Co. properties, and, upon completion of that project, he became valuation engineer for PG and E in 1912. Following his appointment in 1922 as vice-president and executive engineer in general charge of valuation, rate, land, and statistical departments, Mr. Vincent handled rate negotiations and other phases of the company's business for the California Railroad Commission and other bodies, and was widely known in professional circles. He was an associate member of the American Institute of Electrical Engineers.

● WILL O. SMITH, 54, Denver district manager for General Electric Supply Corp., died Dec. 26 of a heart ailment. Born in Kansas in 1891, he had been associated with G-E Supply for 26 years. He joined a predecessor company at Butte in 1915, stayed on with G-E when it took over. From 1930 through 1944, he was district sales manager at Salt Lake City, leaving there Jan. 1, 1945 to go to Denver. He was active in electrical groups and had served as president of the Electrical League of Utah.

● FRANCIS JOHN CONNOLLY, 52, formerly manager of the Electrical Contractors Assn. and manager of the Southern California Chapter of Associated General Contractors for 12 years, died Jan. 14. He was associated with many of the larger construction projects in the city and adjacent areas, including Boulder Dam and the Metropolitan Aqueduct. Born in Massachusetts, Mr. Connolly moved to southern California 30 years ago.

● CLYDE C. RUBLE, 63, engineer with the Los Angeles Department of Water & Power, died of a heart attack on Dec. 15. During his career he also served with the Bay Counties Power Co., and Pacific Light & Power Corp. From 1916 until his death he had been superintendent of San Francisquito power plant No. 1, city of Los Angeles, and engineer in charge of the city's steam and hydro plants.

● FRED JERVIS, president of Bardco Mfg. & Sales Co., Los Angeles, died Dec. 17.

AUSTIN LEVELING BRIDGE FOR SWITCHES AND RECEPTACLES

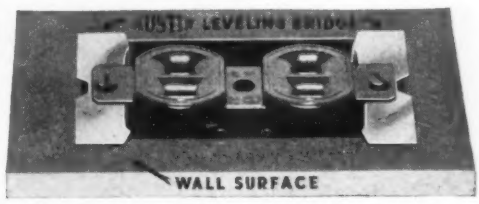
No. 1941

Here is a very inexpensive device that saves time and eliminates all the troublesome problems of leveling switches and receptacles with the surface of the finished wall so that the plates fit perfectly.

It positively eliminates broken or distorted plates and loose switches or receptacles. It is very common to go back to the job to mount the switch or receptacle plates only to find that the box is setting a bit crooked or it is too far back from the wall so that the receptacles do not line up with the plates. The Austin Leveling Bridge completely overcomes this problem.

It rests on the surface of the finished wall and the screws for the switch and receptacle pass through it and into the ears of the switch box. Therefore the receptacle is in perfect alignment for the plate. Ideal for concrete jobs where the boxes seldom come flush.

No matter how far back or how crooked the box may be the Austin Leveling Bridge makes every switch or receptacle fit perfectly with the plate and every plate fit perfectly on the wall. Made for single or two-gang outlets.



Above Illustration shows a duplex receptacle mounted on the Austin Leveling Bridge. Note:—Receptacle is flush with wall surface and in perfect alignment for the plate.

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1941	Single Gang Bridge .	3	100 sets	500 sets	$2.05	$1.75	$1.55
1942	Two Gang Bridge	5	100 sets	500 sets	4.10	3.70	3.35

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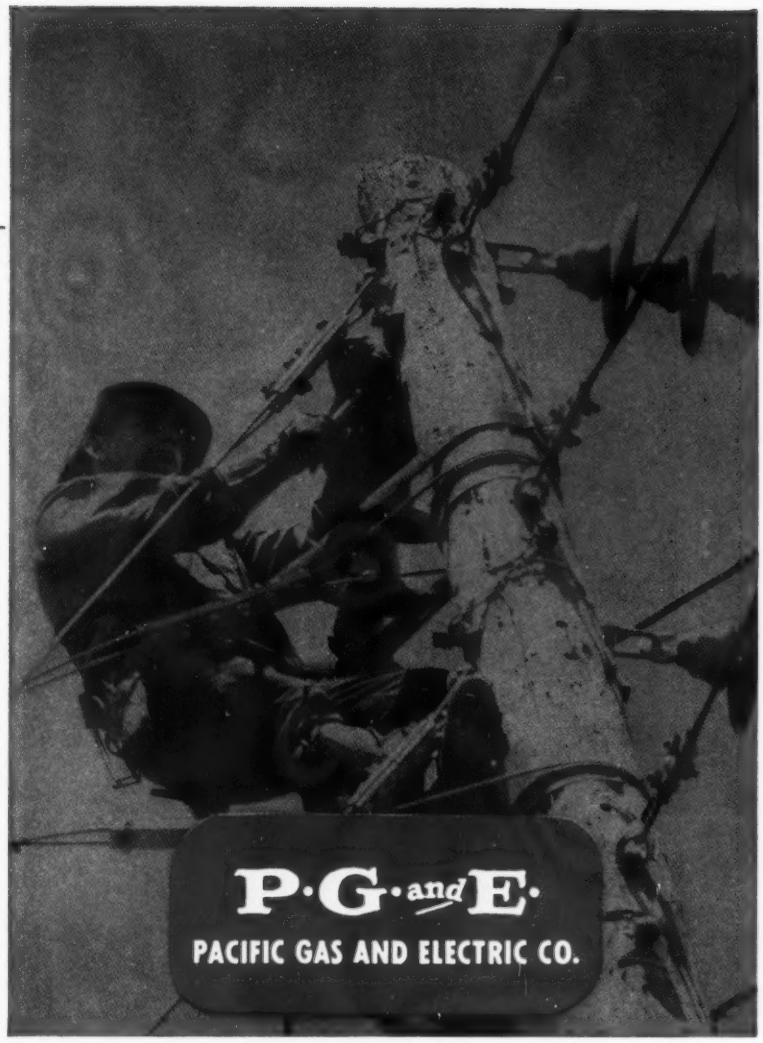
PROFILES *of the month*

Recently appointed department managers of Sues-Young Co., Los Angeles distributors, from left; Marshall C. Wells, traffic appliance division; Jack McLennan, Zenith radio division; Joseph Wogan, major appliance division

"Doc" A. E. Holloway, San Diego Gas & Electric; Major E. W. Moore, Sunbeam appliances; Archie Marsden, G-E appliances, at recent San Diego conference

When O.J.C. Norem (center), former U. S. minister to Lithuania, told the Electric Club of San Diego his views of Europe's situation today, O. G. Thompson, vice-president, turned over the gavel to past president Bill Powell to introduce Norem



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This is our projected construction budget in this new year of 1946 for plant and line improvements—better to serve Northern California.

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Pacific Gas and Electric Company is now running a series of colorful advertisements in leading national magazines to attract new business and new industries to Northern California.

Your gas and electric company will keep ahead of demand; it will continue to provide abundant supplies of electric power and natural gas fuel at rates among the lowest in the nation.

For a Greater Northern California

EW 2X—246

Electric Wiring can be Overloaded, too!

Like an overcrowded streetcar, the electric wiring in many homes is so inadequate that full electrical service is impossible. Too few electrical circuits, outlets and switches . . . too small wire—these limit the use of appliances and cause overloading of existing circuits. More than this, inadequate wiring is a barrier to the sale of new appliances. • The entire electrical industry would benefit from the installation of adequate wiring in the thousands of now improperly wired homes on the Pacific Coast. So would the owners of those homes. Plan now to do something about it!

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